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THE MARINE REVIEW

A Monthly Publication Devoted to Ship Building, Marine Engineering and the Business of Transportation by Water.

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IN THIS ISSUE

	PAGE		PAGE
Results of the Policy of Meddling.....	299	What the Government is Doing.....	315
Modern Cargo Handling Methods.....	300	New Fleet for Pacific.....	316
How Many Engineers are Needed?.....	305	Effect of Seaman's Act on England.....	317
Follow the Outside Course.....	308	American Ship Yard Activities.....	319
Duluth Harbor Needs Breakwater.....	309	Seattle Concern is Purchased.....	320
Photographs From Far and Near.....	310	U. S. Ship Yards Regain First Rank....	322
Province Aids Ship Building.....	312	In the Traffic Manager's Office.....	329
Gulf Storm Damages Ships.....	312	On the Coasts, Lakes and Rivers.....	331
Late Decisions in Maritime Law.....	314	Red Hot Tips From the Trade.....	334

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THE MARINE REVIEW



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Results of the Policy of Meddling

Does the American Marine Need Relief From Antiquated Navigation

Laws or Rest from the Present Deluge of Congressional Restrictions?

IN WASHINGTON, we have 531 earnest-minded legislators, and each one harbors an intense solicitude for the welfare of our merchant marine. This warm regard manifests itself by the introduction of bills in the house and senate, this being the only form of activity with which the legislative mind is familiar. The result of this experimenting is a nauseating concoction of laws, legal restrictions and enactments that serve no purpose other than to remind one forcibly of the truth of the adage that too many cooks spoil the broth. For it is clear that a cloying glut of laws retards, restricts and even constricts our maritime development.

The opinion is generally held that a commensurate increase in our merchant marine depends upon the modernization of our ancient navigation laws—laws that are hoary relics of the days of sails and wood, not of modern steam and steel. Two years ago this opinion freely obtained among the few who had given our merchant marine even a passing consideration. Now, with the poignant lessons of the world war still fresh, the number interested in and familiar with the subject has increased greatly, an increase that is greater in mere numbers than in intelligent appreciation.

New Laws Worse Than Old

While indubitably true that many of our old laws need to be revised in the light of our modern knowledge, it is equally veritable that as many of our new laws need either revision or complete elimination. These new laws, while passed in the days of steam and steel, apparently were drawn up with a weather eye on their vote-producing qualities.

The latest, and with all due respect to its many ill-advised predecessors, one of the worst efforts of this latter nature, is H. R. 8036, entitled "A Bill to Regulate the Officering and Manning of Vessels".

Regulates the Officering and Manning of Vessels

The readers of *The Marine Review* will find on a succeeding page an exhaustive analysis of this bill, its efforts, and its dynamite-charged provisions.

The bill requires every American ocean and coast-

wise seagoing merchant vessel of 1,000 gross tons and over, propelled by machinery, to carry three licensed assistant engineers and one licensed chief engineer, irrespective of size of engines, quantity of machinery on board or importance of engineering work to be performed. The same type of vessel of over 200 gross tons and less than 1,000, engaged in similar service, and a vessel of from 100 to 200 gross tons, engaged in trade at sea on routes of more than 24 hours, must have on board three licensed engineers.

Taking Lessons from England

The article ably points out that our legislators, if sincere in their attempts to build up the American marine, would do well to study the methods that have brought the great world fleet of Great Britain to the front rank. This premier seafaring nation, with the accumulated knowledge of years in her possession, is content to operate any machinery-propelled vessel with a maximum of two licensed engineers, irrespective of size, power, length of voyage or other consideration.

The United States already prescribes 16 grades of marine engineers' licenses, and in addition generally states on each license the maximum gross tonnage of the vessel on which the licensee may serve. That this practice is foreign to common engineering knowledge, is clearly proved by the table accompanying the article mentioned—a table showing 16 groups of vessels, in each group of which the vessel with the greatest tonnage has less horsepower, and requires less engineering labor, skill and knowledge than the vessel with the smallest tonnage.

The legislator who bemoans our decadent marine and concurrently introduces another bill for its speedy upbuilding, may be incapable of perceiving the interrelation of his actions. To others, though, it is clear. Our marine will not and cannot thrive on toxic injections of new laws at frequent intervals. The patient, barely rallying from the effects of one poisonous secretion, is assaulted by another. His good health depends upon freedom from the superabundant doses prescribed by amateur practitioners.

Modern Cargo Handling Methods

Time Required to Load and Discharge Cargoes of Ships is
All-Important Factor in Problem of Marine Terminal Design

By H. McL. Harding

THE QUESTION as to what are and what will be the cargo handling methods and appliances best adapted to the conditions of the inland and ocean ports of the United States, should be answered in such a way as to be of applicable value to maritime interests. To reduce a ship's detention in the harbor to the minimum, a ship tied to the pier being a liability, not an asset; to obtain the greatest return from the marine terminal investments in piers, quays, machinery and buildings, and yet to reduce the port charges to such low figures that they will not be a burden on commerce; to change the present methods so that the cost of transference and of handling at terminals will not be, as it often is, more than the water carriage between the ports; these are objects of prime importance.

It is not sufficient to describe isolated and existing installations, which may not be those best adapted for general service, but rather to trace the progress of improvements and to show the trend of development, and from a presentation of this study, to make suggestions for standard methods and appliances. The high cost of the present methods of handling miscellaneous cargoes and the time required to discharge and load vessels, in comparison with the results obtained at foreign ports, indicate the necessity for this study and recommendations.

There are two general classes of cargo-transferring machinery — those on the ship and those on the shore.

Cargo Classifications

In general, two kinds of cargoes are handled; the miscellaneous, composed of merchandise of every description, generally known in railway transportation as package freight; and bulk material, as ore, coal, sand and rock, and cargoes composed chiefly of one commodity, as lumber and cotton.

This article will confine itself chiefly to the more advanced methods for handling miscellaneous cargoes, and will describe in a brief manner the ore and coal and special commodity appliances by means of explanatory illustrations. Some am-

biguity appears to exist as to the use and meaning of certain words descriptive of marine terminal elements. For clearness the following definitions are suggested. For example, the word "dock" is sometimes used for the word "wharf" and also for the water slip where the vessel is berthed. It seems best, therefore, to use the word "slip" for water space between piers. The word "quay" is to signify the wharf parallel to the shore, and "pier", a wharf projecting into the waterway. "Transferring" or "trans-

shipment" and the "transfer shed". "Warehouse" is the name applied to several stores placed to the rear of the shed. The function of the warehouse is for long freight storage and it is equivalent to a storehouse. "Burtoning" indicates shifting the weight of a draft, or the draft itself, from one fall rope to another.

When the terminal is located along a comparatively narrow river, quays are constructed, but where broad water areas exist, piers are built, extending into the waterway, either diagonally or at right angles to the shore line.

The Marine Terminal

The elements of a complete marine terminal consist of piers, slips, quays, railroad tracks and various railway yards, sheds, warehouses, dray areas, open storage spaces, and often public markets, cold storage buildings, coal pockets and manufacturing lofts. There are also sheds and warehouses for special commodities. A modern terminal may comprise more elements, but these are enumerated so as to indicate the principal cargo movements. Between each of these elements and the vessel and cars there may be at any time an interchange of freight. The following are the principal freight movements, or methods, which require appliances:

Between the ship and the open pier and the open quay and the shed or warehouse.

Between the ship and other ships or vessels or transshipments.

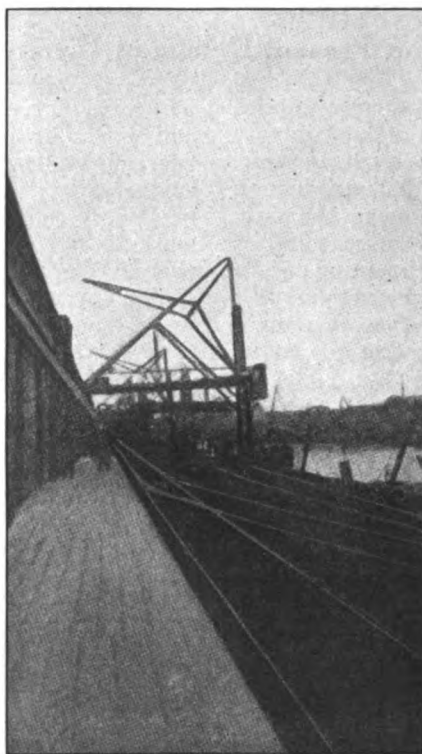
Between the ship and cars.

Between the shed and the warehouse.

Between the ship and dray areas.

Between the cars and the terminal buildings.

By following the course of one consignment in discharge, the possibility for improvement over existing methods is made clearer. The bale, box or barrel may be between decks at some distance from the hatchway, as in the lower hold of a tramp steamship. The hook of the ship's fall rope, suspended from one boom, is attached to the package, and the load is drawn to and up through the hatchway above the height of the ship's rail, being then burtoned to the hook of another fall rope, suspended from a second boom, and lowered upon a space of about 8 to 10 feet radius on the side of the pier. Two winches are required for these services, one on the ship and one on



FRONT VIEW OF AN INLAND TERMINAL SHOWING TRACKS AND CRANES

ference" refers to the freight movements between the vessel and the shore, between the shed and the warehouse, or where there is one direct unbroken movement. "Handling" is the general term to indicate the movements upon the pier and quay, or in the shed or warehouse, including assorting, distributing and tiering. "Stowing" is the placing the cargo between decks, and "shed", a building, usually of one story, erected on the pier or quay, which is used in handling and temporary holding of cargoes and designated respectively

A paper read at the 1915 Engineering Congress, San Francisco.

the quay or pier, besides the rope man. The load is then assorted, distributed and tiered by manual labor. The weight of such a draft to be assorted is seldom above two tons, with general merchandise, and averages about one ton or less.

Gantry Obviates Congestion

By means of the traveling gantry jib crane, at a terminal property designed for the installation of mechanical appliances, the load is placed by one movement anywhere within a space of 50 feet radius, there being only one hoisting mechanism and one operator. This large space avoids congestion at the place of deposition. As the average weight of one consignment, or mark, averages, on steamships, from 1,500 to 2,000 pounds it is desirable to hoist one consignment only in one draft, then burtoning not to the fall rope of another boom, but to the hook of an overhead traveling hoist, and thereby avoiding the assorting, distributing and tiering by manual labor, all such movements being made by machinery. The most rapid transfer of freight between the vessel and the shore does not depend wholly upon the transferring machinery, but also upon the design of the ships.

Where there can be a clear vertical lift of the cargo from the hold of the ship, with the elimination of the horizontal movement between the decks to the hatchways, an average saving of more than 50 per cent in the cost and in the time of transference can be effected. As there are often 12 to 14 men, and sometimes even more, in the hold at each hatchway to perform this horizontal movement and to attach the hooks, it will be seen that this statement is conservative. To secure the vertical lift, hatches have been made longer and wider and, in length, nearly continuous. In breadth they have become almost equal to the ship's beam. In the interior of the ship are now large clear spaces, the decks not being supported by many small

pillars, but by longitudinal girders under the beams.

For such commodities as lumber, ore and coal, special ships have been designed with almost continuous hatches to facilitate the rapid loading and discharging of cargoes by direct vertical movements. Many special handling devices have been proposed and some have been installed on ships, as the coal bridges on the United States colliers JUPITER and JASON, which have been used for packages. Revolving derricks have also been used. In one of the latest reports of a commission of the United States army engineers it is recommended, especially for inland waters, that the transferring appliances on ships be as few and as simple as

boom to another, either by shifting the weight or by transferring the load from the hook of one fall rope to the hook of another. By this latter method, while one draft is being hoisted from the hold another is being lowered to the deck of the pier, or quay, thereby effecting a saving of nearly one-half of the time, as two drafts are in motion at the same time.

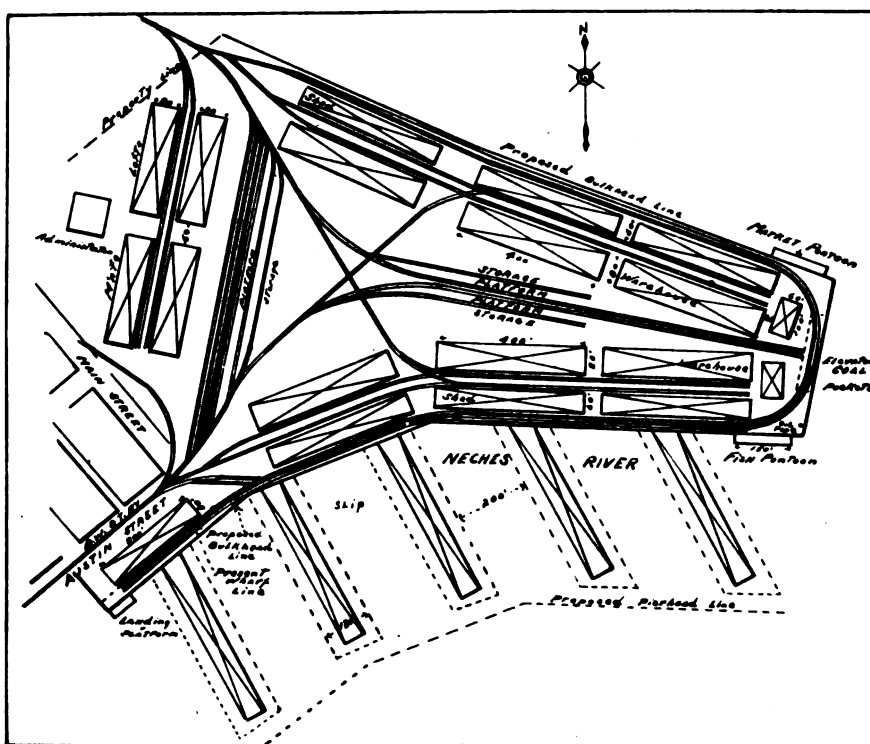
Reducing Time at Ports

The increase in the tonnage capacity and in the costs of modern ships makes it imperative that on the ship, or on the shore, nothing should be left undone to reduce the time of the ship's detention at ports. By means of the ship's winch, about 20 drafts per hour may be discharged.

This could be increased were it not for the limited space served on the pier alongside, generally of not more than 10 feet radius. Unless there is an excess of hand-truck men, the congestion at this point is generally the limiting speed factor. In the ship's machinery may be included floating cranes and floating derricks; barges with shear legs and various steam, electric and gasoline hoists; floating coal transporters; portable coal conveyors with suspended chutes; and

*mast booms with grab buckets and grain elevators. Floating derricks are used for excessive weights, and where there are no lighting appliances of sufficient capacity on the ship. Coastwise ships frequently load and discharge by manual labor, with hand trucks, through side ports. The following figures, taken from the house of representatives' document No. 226, sixty-third congress, 191, show the expense of this method of operating, through side ports, as given by the Southern Pacific Co., New Orleans.

"The average cost of handling for the year ending Dec. 31, 1910, was 54.85 cents per ton of 2,000 pounds, reduced to a basis of 30 cents per hour for labor. Thirty cents per hour is paid for straight labor and 40 cents per hour for night and Sunday work.



GENERAL PLAN OF THE KIRBY POINT PROJECT, BEAUMONT, TEXAS.

possible. The steam winch still remains the favorite type of cargo-handling appliance. Winches have been enlarged from a single 6x10-inch winch at each hatch, to a pair of 8x12-inch winches. The derrick boom is now a steel tube of 5 tons capacity, operated by a 25-ton machine at the end of the vessel. The diameter of the drums has been increased to 24 inches, and the steam pressure doubled. These derrick booms are attached, not only to the masts, but to separate columns and to hollow steel tubes, which also serve for ventilating pipes.

Burtoning Saves Time

The general ocean freight rule is for all drafts to be burtoned; that is, the load is transferred from one

The men are assisted by five electrically-driven ramps approximately 70 feet long, each of which is driven by a 15-horsepower motor, at a maximum speed of 225 feet per minute.

"In addition to taking twice as long to handle cargo, the cost of operating through over-all hatches and with manual labor would be, without the use of conveyors, approximately 25 per cent greater."

"This would make the cost of transferring and handling miscellaneous freight through the over-all hatches 68.56 cents per ton. It is claimed by the agents of ocean liners that the cost is much less through over-all hatchways than through side ports.

"This may be due to the time the hand truck men are within the ship waiting to deliver or receive a hand truck load of about 250 to 300 pounds.

The steamship *ANTILLES*, which was docked at 8:30 a. m., Jan. 25, 1913, discharged a load of 1,725 tons in 11½ working hours, or an average of 150 tons per hour, employing 355 men. This would be at a cost of transferring at 70 cents per ton passing through side ports and handling by manual labor. This same ship, *ANTILLES*, was loaded with 2,831 tons in 21½ working hours, or an average of 130 tons per hour, employing 200 men. The cost on *ANTILLES* through side ports was 70 cents per ton and the cost through over-all hatchways would have been approximately 87.50 cents per ton.

The maximum recorded speed per hour was 150 tons in discharging and 131 tons in loading.

In 1912, 581,172 tons were thus handled at New Orleans over 2,100 lineal feet frontage, or about 276.75 tons per lineal foot. This result, with the operation confined to manual labor, shows excellent management and compares most favorably with other cities, per lineal foot transferring capacity. New York averages only about 150 tons per lineal foot. The above figures of cost through side ports and through over-all hatchways, and of the speed of transference and handling, should be compared with those given later, for the traveling jib gantry and overhead traveling hoists. The continuously increasing size and the carrying capacity of freighters are causing marked changes in the design of machinery and methods of operating.

A common size of the large ocean freighters may be taken as 500 to 600 feet in length, weighing about 7,000 tons and carrying 8,750 tons of cargo. The dimensions and carrying capacities are used in determining berthing lengths.

Every day that can be saved in the detention of a large ship may be said to represent a saving of \$600.

A distinction should be made between the passenger ships of the north Atlantic and the freighters, in reference to length and freight carrying capacity.

The following is the advance of the dead weight carrying capacity of the vessels of one line of cargo tramps:

In 1895	6,400 tons
In 1913	9,600 tons

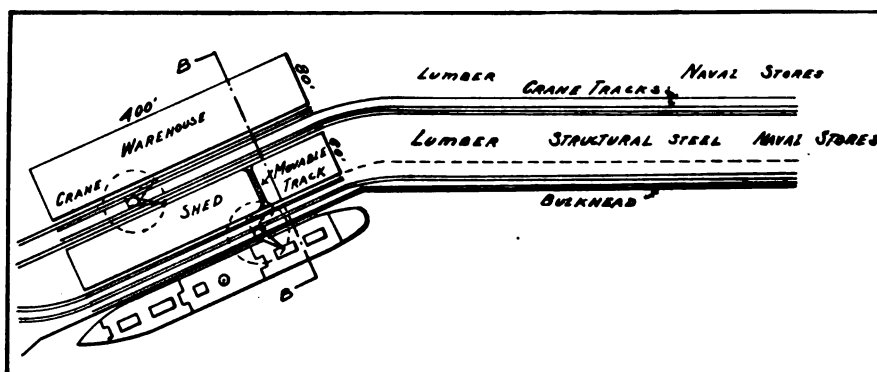
It is expected that freighters will next increase more in beam.

Shore Appliances and Terminal Design

Not only is the ship being designed to secure rapidity of transference, but the plan of the quays and piers with the sheds and warehouses, and their relative positions to each other, is receiving attention, so as to secure the most expeditious transference and handling. As rehandling produces congestion, and as even a moderate amount of congestion adds 50 per cent to first handling costs, all designs

principles of terminal design were derived; and these principles may be said to indicate what is the trend of development and progress now being made in the United States. By following them, mechanical appliances may be installed to advantage. It can hardly be stated that these principles have been extensively adopted; but this is due to the fact that, except for special commodities, all terminal construction has been slow. With the advent of the new interest in a merchant marine, and the extension of foreign commerce, it is expected that the progress during the next few years will more than equal that of the last 25. It may be said that this progress is being based upon foreign methods as the result of their experience, but adapted to American conditions.

The accompanying diagrams illustrate the general plan of a marine terminal along an inland river equipped with mechanical appliances. Between the



PLAN OF AN INLAND TERMINAL SHOWING RELATIVE POSITIONS OF SHIP, QUAY, TRACKS, SHED AND WAREHOUSE, WITH TRANSFERRING CRANES AND OVERHEAD HANDLING AND TIERING MATERIAL, AND OPEN SPACES FOR SPECIAL COMMODITIES AND BULK MATERIAL

and plans aim to eliminate rehandling.

Not many years ago no uniformity existed in the design of marine terminals. No rules were accepted, and on this account there is a wide diversity shown in terminals in various sections of the United States. Where there were no accepted principles based upon experience with cargo handling appliances there naturally occurred a copying of some nearby wharves, often of an obsolete type, generally those of some larger city. From a study of quays, piers and the machinery at foreign ports, compared with those in this country, it became evident that in order to secure the quickest movements of mixed cargoes to and from ships, the design of the whole terminal was an important factor.

As a result of many reports of the federal government, of states, cities and of engineers, and from visits by the writer to many ports, certain

water's edge and the shed there should be a width of about 35 to 45 feet of quay; 35 feet for two lines of tracks, and 45 feet for three lines. To the rear of this quay space is the shed, usually of one story, from 60 to 80 feet in width, from 400 to 500 feet in length and with from 30 to 40 feet of clear space beneath the cross girders. The warehouse, of a width of 80 to 100 feet, 4 to 6 stories in height and equal in length to the shed, is placed behind the shed, and parallel to it, at a distance of 45 to 60 feet. In the space back of the warehouse are dray areas, open storage spaces and additional railway tracks.

The space nearest the water, with railway tracks depressed to the level of the pavement, is spanned by a half or full arch traveling gantry jib crane. Freight, if of few marks, can be swung directly from the car to the hatch of the ship at a cost of about 3 cents per ton, for the mechanical

movement only, 40 full drafts per hour being possible with the crane. Each draft averages two tons in weight, which would be equal to about 80 tons per hour per crane. With two cranes per hatch and four hatches, the eight cranes would have a capacity of about 640 tons per hour. These figures should be compared with the record of ANTILLES at New Orleans. Similarly, the load could be taken from drays in this quay space or from the side door of the shed. With inbound cargoes the loads can be swung from the hatches to the side of the shed; but as only one consignment, averaging in weight between 1,500 and 2,000 pounds, is lifted in one draft, the hourly capacity is less than with outbound cargoes. These figures of capacity may be greatly increased if a large proportion of the cargo is of one material and of few marks.

With both this inbound and outbound freight, the movement, as de-

For outbound freight, as stated, it is not generally necessary, according to the marks, to assort the freight; although it should be placed in the vessel according to its character or, if the vessel stops at different ports, it should be placed for easy delivery at the different cities. Miscellaneous inbound freight, however, should be first assorted, according to consignment, and then distributed and tiered.

Shed Capacity and Tying

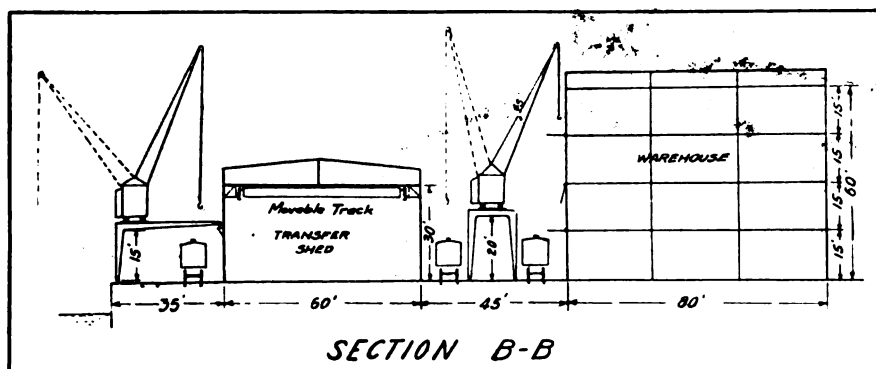
It is a good rule to plan the shed for such a capacity that it will be possible to distribute in it all the goods taken from one ship berthed opposite to it. When goods are handled by hand, the average height of tying or piling averages about 5 feet. It is, therefore, evident that there would be required a very large floor area to distribute and place a cargo of 6,000 tons according to the marks and cross marks, especially if it is a miscellaneous cargo. Assuming 60

additional expense over tying 5 feet.

Assuming an average height of tying at 15 feet, a building could be made 56 feet in width, 500 feet in length, and yet have a capacity of 6,000 tons, at 70 cubic feet per ton. In order to allow even more floor space for the distributing, or a greater holding-shed capacity, 20 feet may be taken as an average tying height. A shed, therefore, 60 feet wide, 500 feet long and with a clear height below the girders of 30 feet, tying 20 feet, would accommodate 8,500 tons, allowing 70 cubic feet per ton. This, or a shed 400 feet in length, would be a properly proportioned shed for inland river terminals. It is interesting to note that 60 feet is the standard width of inbound railway freight stations. For larger freighters at ocean terminals, the length per berth could be increased to 600 feet and the width to 800 feet, giving a holding capacity of about 13,700 tons.

If the width of the sheds can be kept within the above limits, the cost of the shed will be less than is usual, as there will be one short span only and no intermediate posts to interfere with the freight movements. Such posts should be avoided if possible. It is evident that capacity is secured by height and not by width, and that the floor space inside the shed should not be occupied by railroad tracks nor used as a dray area. In general, the railway tracks should be in front of and behind the sheds and not in the sheds. The functions of the shed are chiefly for assorting, distributing, tying and temporary holding for 48 to 72 hours. The mechanical appliances should occupy no floor space for this tying, or for the assorting and distributing.

The function of the warehouse is to relieve the shed of cargoes which are not removed within the 48 to 72 hours. Each shed should have its accompanying warehouse, to prevent congestion in the shed. A cargo may remain in storage in the warehouse as long as the storage rates are paid. From the warehouse, goods will be transferred to drays, cars, sheds, and often to ships, barges or lighters for the warehouse, the full-arch gantry crane can transfer goods directly between the warehouse and drays or railway cars. On a projecting pier, both sides of the pier shed would be the same in design. If the pier should be 150 feet in width, it would include the 35 feet between the quay wall and the shed, with tracks and cranes; the shed, 80 feet in width, with its assorting, distributing and tying machinery; then a 35-foot space between the shed and the quay wall at the other side of the pier, with its tracks



SECTIONAL VIEW OF AN INLAND TERMINAL SHOWING QUAY WALL, HALF-ARCH GANTRY CRANE, RAILROAD TRACKS, SHED WITH OVERHEAD FIXED AND MOVABLE TRACKS, FULL-ARCH GANTRY CRANE, CARS AND WAREHOUSE

scribed above, is only from or to the shed, cars or drays. For movements across and within the shed to within reach of the hook of the gantry crane, including tying, provision is made by the overhead movable cross-tracks in connection with the fixed side tracks. On these travel the electric hoists, by means of which it is possible to serve every cubic foot of space rapidly, without any rehandling by manual labor. This includes mechanical assorting, distributing as well as tying. The cost of freight moved from the hold of the ship and tiered in the shed, using the cranes and traveling hoists, may average about 15 cents per ton. Between the shed and the warehouse, high, full-arch gantry cranes will swing freight between the floor of the shed or the hooks of the hoists and any of the four or six floors of the warehouse. The load is brought within reach of the hook of the crane for burtoning by the hoists.

cubic feet, instead of the marine 40 cubic feet, to represent the volume of one ton and 15 per cent more for distributing space, this would equal about 70 cubic feet per ton. Six thousand tons would, therefore, represent a cubical content of 420,000 cubic feet, and, at an average height of 5 feet, would cover a space of 84,000 square feet. As the average freight, not passenger liner, is about 500 feet in length, and the length of the shed should correspond to the length of the ship, this would mean a building 500 feet in length and 168 feet in width for this tonnage. The reason for the 5-foot height for average tying is that manual lifting above this height means a considerable increase in the handling expense. It is more economical to hand truck goods 400 feet than to lift them 10 feet by man power. By mechanical tying, freight can be tiered 20 or even 30 feet high, with little, if any,

and cranes. Transference between the pier shed and the quay shed and warehouse is by the overhead fixed and movable tracks and small motor trucks.

Freight Handling Equipment

It can be asserted that combinations of the traveling gantry jib cranes, the ship's winch, the overhead traveling hoists in trains, and the movable tracks and the electric motor truck fulfill all the exacting conditions of the transferring and handling of miscellaneous cargoes or package freight. Great flexibility and large range of operations are attained, eliminating delays and congestions, and reducing the employment of unskilled manual labor to the minimum, with a continual succession of movement of the freight.

There is a great variation in the cost and speed of cargo transference and handling, due to different kinds of

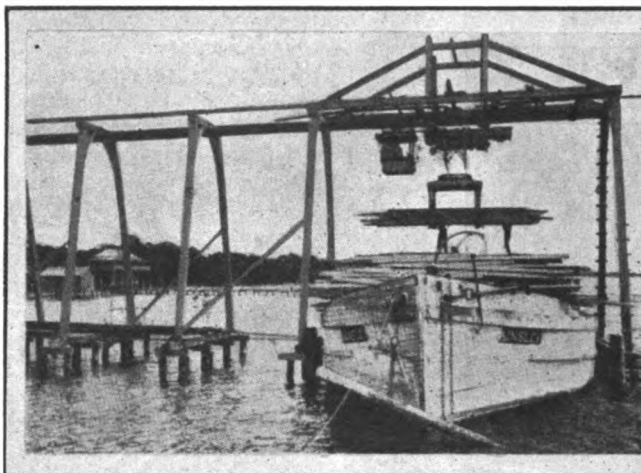
tracks, elevated 17 to 25 feet above the rails, with a jib length of 50 feet and a radius of 35 to 50 feet. It is capable of lifting two tons at a speed of 3 to 4 feet per second; or 3 tons, or even more, at a proportionately less speed. The slewing is from 7 to 10 feet per second, or $2\frac{1}{2}$ swings per minute. The traveling speed is about 70 feet per minute. There is a slow speed motor for each movement, preferably, a direct current motor. The characteristics of these cranes are the quick movements of lifting, rotating, lowering, starting, and positive braking. The controlling cab is placed within the jib members, so that the operator may obtain an unobstructed view of the complete hoisting operations.

Traveling hoist trains consist of one tractor, or the conveying mechanism, drawing three or four electric hoists. All are controlled by one transferman. The speed of the train is 750

important and common types as follows:

- Portable electric dock winches, with 20-horsepower motors.
- Stationary, electric dock winches, with 18-horsepower motors.
- Floating steam hoisters.
- Floating grain elevators.
- Whip hoists.
- Traveling unloaders, 5 to 10 tons capacity.
- Elevated stationary hoisting winches.
- Pillar cranes.
- Locomotive cranes.
- Stationary bridge cranes.
- Lifting towers and belt conveyors.
- Derrick booms and grab buckets.
- Coal dumps on tipples.
- Barrel conveyors and elevators.
- Gravity chutes and conveyors.
- Bag and box chutes.
- Passage escalators.
- Cargo chutes.
- Blind hatch hoists.
- Stationary cranes, hammer type, of great capacity.

As an example of one of the latest and best coal-handling plants of large capacity, reference is made to the installation at Panama for the United States government.



UNLOADING PLANT OF A FLORIDA LUMBER COMPANY



OVERHEAD TRAVELING HOISTS HANDLING SUGAR BETWEEN SHIP, SHED AND WAREHOUSE

cargoes and favorable or unfavorable conditions; but with a correctly designed terminal, using the mechanical appliances as described, manual labor costs and the time of loading and discharging can be reduced by one-half.

In the place of the gantry jib crane, the transporter or the cantilever gantry crane can be substituted, in some cases, to great advantage; but on account of the single or double gantry jib crane being able to serve some 100 feet of lineal water frontage without any traveling movement, and the facility with which, combined with the overhead traveling hoists, burtoning can be effected, preference is generally given to this type.

The following are a few of the general specifications for gantry jib cranes.

The half-arch or semi-portal crane has a horizontal limb of from 35 to 50 feet spanning two or three

feet per minute with 6 to 8-ton load.

Each of the hoists has a lifting capacity of 2 tons at 60 to 80 feet per minute, or 3 tons at less speed. Two traveling hoists combined can give a lifting capacity of 4 to 6 tons. The connection between the movable cross or loop track and the fixed track is by means of gliding bridges. The number of traveling hoists is proportioned to the number and capacity of the gantry cranes, so that in burtoning from the hooks of the gantry cranes to the hooks of these traveling hoists there is no delay or congestion, either of the cranes or hoists.

Types of Hoists are Many

Many types of hoisting and conveying appliances are installed at marine terminals, but these as a rule are designed for special commodities and not for universal application. It is possible only to enumerate the more

In loading iron ore into ships, the ore is brought from the mines in cars, each holding about 50 tons, and is dumped through bottom doors into the ore dock pockets, taking often only 15 seconds per car. From the pockets, the ore runs by gravity through many hatches into the hold. A vessel can be loaded with 12,000 tons of ore in one hour. For unloading cars of coal into the ships, the most efficient method consists in raising the car filled with coal and, by inversion, dumping it into the vessel. Such car dumps have a capacity of 900 tons per hour. For transferring sand, gravel and a smaller coal tonnage, jib cranes of various types and bridge transporters are installed. These have a capacity of 60 to 100 tons per hour.

For the handling of phosphate rock, moving belts to the ship's side are

(Concluded on page 318)

How Many Engineers Are Needed?

A Frank Discussion of the Crew Question Compiled by the American
Steamship Association—British Legislation a Help Not a Hindrance

WHEN one is seeking success in any undertaking, the logical and most important thing to do is to study the methods that have produced the desired results by those who have been successful in similar undertakings. The mercantile marine of Great Britain today, in size and importance, far surpasses that of any other nation; that it has been operated in the past with success equaled by few countries, and surpassed by no other, there can be no argument. The question naturally arises, has Great Britain obtained her supremacy on the seas by adopting legislation similar to that now pending in congress? It also may be pertinent to inquire, if the bills in question are enacted into law, will they bring forth, or assist in creating, "the great merchant fleet" which President Wilson has so eloquently stated the country must have. Should the contemplated legislation become a law, every ocean and coastwise sea-going merchant vessel of 1,000 gross tons and over, propelled by machinery, must have in her personnel three licensed assistant engineers and one chief engineer (also licensed); this irrespective of the size of engines, quantity of machinery on board, or importance of engineering work to be performed.

Likewise a machinery-propelled vessel of 200 gross tons, and less than 1,000 gross tons, engaged in similar service (on routes of any length), and a similar vessel (machinery-propelled) or from 100 to 200 gross tons, engaged in trade at sea on routes of more than 24 hours, must have on board three licensed engineers.

It is interesting to note that Great Britain has obtained her supremacy on the sea by making it possible to legally operate any machinery-propelled vessel with a maximum of two licensed engineers, this irrespective of size, power, length of voyage or other consideration.

Only Two Licensed Engineers

Under British law there are but two licensed engineers required for merchant steamers, viz., first class engineer and second class engineer, without variation as to tonnage. This requirement is covered in section 92 of the British Merchant Shipping Act of 1894, which now reads as follows:

"Every British foreign-going ship and every British home trade ship, when going to sea from any place in the United Kingdom, and every foreign steamship carrying passengers between places in the United Kingdom, shall be provided with officers duly certificated under this act according to the following scale:

"If the ship is a foreign-going steamship of 100 nominal horsepower or upwards, with at least two engineers, one of whom shall be a first class and the other a first class or second class engineer duly certificated;

If the ship is a foreign-going steamship of less than 100 nominal horsepower, or a sea-going home trade passenger steamship with at least one engineer who is a first class or second class engineer duly certificated.

The bill discussed in the accompanying article in H. R. 8036 and is intended "to regulate the officering and manning of vessels." Our staff representative at Washington advises The Marine Review that there is little likelihood of this bill being passed at this session. Adjournment has already been protracted beyond the time originally set and there are several important administration measures still to be acted upon. But it probably will be brought up again next year. Kill it now!

In explanation of the words "foreign-going ship" and "home trade ship," the British statute says the following:

"Foreign-going ship" includes every ship employed in trading or going between some place or places in the United Kingdom, and some place or places situated beyond the following limits; that is to say, the coasts of the United Kingdom, the Channel Islands, and Isle of Man, and the Continent of Europe between the River Elbe and Brest inclusive. "Home trade ship" includes every ship employed in trading or going within the following limits; that is to say, the United Kingdom, the Channel Islands, and Isle of Man, and the Continent of Europe between the River Elbe and Brest inclusive. "Home trade passenger" means every home trade ship employed in carrying passengers.

Thus it will be seen that a foreign going ship of small power (less than 100 nominal horsepower) can operate to any part of the world with only one licensed engineer, who may be an engineer of the second class. Likewise a passenger ship of any size or power of machinery may operate coastwise, and to nearby territory in France, Belgium, Holland and Ger-

many, with only one licensed engineer, who may only have a second class certificate. Cargo vessels of any size or power are allowed by the above laws to operate coastwise, or to nearby foreign countries, without any licensed engineer.

Sixteen Grades of Engineers

Compare the British requirements with those of this country at present in force. Under the general rules and regulations of the board of supervising inspectors of steam vessels, which, pursuant to that act of Feb. 14, 1903, have the force of law, the following sixteen grades of marine engineers' licenses are prescribed for our merchant marine:

Chief engineer of ocean steamers.
Chief engineer of condensing lake, bay and sound steamers.
Chief engineer of non-condensing lake, bay and sound steamers.
Chief engineer of condensing river steamers.
Chief engineer of non-condensing river steamers.
First assistant engineer of ocean steamers.
First assistant engineer of condensing lake, bay and sound steamers.
First assistant engineer of non-condensing lake, bay and sound steamers.
First assistant engineer of condensing river steamers.
Second assistant engineer of ocean steamers.
Second assistant engineer of condensing lake, bay and sound steamers.
Second assistant engineer of non-condensing lake, bay and sound steamers.
Second assistant engineer of condensing river steamers.
Third assistant engineer of ocean steamers.
Third assistant engineer of condensing lake, bay and sound steamers.

In addition to the above sixteen grades specified in the rules, the United States local inspectors of steam vessels make a practice of stating on an engineer's license the maximum gross tonnage of the vessel on which he may serve. This limitation is irrespective of power of ship, or engineering skill necessary to successfully perform the duties required. The gross tonnage of a vessel is no criterion of the quantity or quality of engineering labor or skill necessary to operate it safely and successfully, and it is surprising that an engineers' association, composed of practical men, should have used the tonnage standard in their endeavor to make laws to govern the number of men to be employed on machinery-propelled vessels.

The accompanying table shows sixteen groups of vessels, in each group of which the vessel with the greatest tonnage has less horsepower, and requires less engineering labor, skill and knowledge than the vessels with the

smallest tonnage. The vessels in this table are not exceptional cases: the list could be extended almost indefinitely.

The practical effect of the American requirements, and the way they are enforced by the steamboat inspectors, is to artificially create a restriction on the number of men available, which no legislation should seek to promote. Great Britain's unchallenged success as a maritime nation is largely due to the fact that her legislature has not sought to hamper the operation of her ships by such handicaps as have been imposed on American steamers. Is it any wonder, then, that our overseas tonnage is so small in comparison with that of our trade rivals?

American steamship operators have much reason to complain that they are constantly being menaced with artificial handicaps, imposed by government fiat, from which their foreign competitors are exempt; that no sooner is one sweeping change precipitated, involving an expenditure of thousands of dollars per ship, than another is promulgated, or a statute enacted by congress, which necessitates the replacement of equipment just installed by other and different equipment; which, in turn may as soon be ordered to be thrown aside and some other substituted.

Not Lacking in Resourcefulness

Any attempt to score our shipowners as lacking in resourcefulness or ingenuity for their failure to restore the merchant marine of the United States to a point commensurate with our past performance, while such legislation remains in effect, would be unjust.

Some agitators have endeavored to show that British vessels carry larger engine room crews than similar vessels under the American flag, and have submitted in evidence a single British ship which had one more man in the engine room than a United States vessel of similar tonnage. The power of the ship, nature of service, and any other condition that would account for this exceptional case, are facts that were not submitted.

Attention is invited to the British fruit steamships AMELIA, BELLA and ANNETTA, of from 1,271 to 1,294 gross tons, and about 1,500 indicated horsepower, that operate with the following engine department crew: Three engineers (only two of whom hold a license), one donkeyman (Chinese) and six firemen (likewise Chinese). Also consider the general cargo boats THYRA MEXIER and HONOREVA, which are owned by the same company as the first three ships previously referred to, and that fly the British ensign. The THYRA MEXIER and

HONOREVA are of 1,452 and 1,457 gross tons, respectively, and of about 700 indicated horsepower. These two ships have for engine department crews three engineers (only two of whom hold licenses), one donkeyman (Chinese) and four firemen (Chinese). The five vessels mentioned are not isolated cases. Many steamers, hundreds if not thousands of British vessels, could be mentioned where the engine room crew consists of only two licensed engineers, one unlicensed engineer and one donkeyman. This is practically the standard crew for the moderate size English tramp ship of 3,000 to 4,000 tons gross register, and 1,000 to 1,500 indicated horsepower.

Handicapped by Law

Compare the engine-room crews noted above with the usual crews carried on American vessels of similar size and power, which are by law required to carry three or four engineers, all of whom have to be licensed; and custom has decreed that all except the smallest powered vessels must carry at least two, and generally three oilers.

If we are ever to expect to increase our shipping to a point commensurate with our national aspirations and importance, our legislation should address itself to the proposition of putting American ships on a parity with those of Great Britain, of the type of ship that has made her unrivaled as the world's cargo carrier. It is the tremendous number of her tramp steamers alone, with their enormous cargo-carrying capacity, which give Great Britain such a preponderance over every other country as a maritime nation.

It is unfortunate that the great mass of our people, whenever they give attention to maritime affairs, think in terms of the large Atlantic liners. Such steamers are most in evidence to the traveling public who pass through our large eastern seaports, and the size and magnificence of these craft make an emotional appeal to the eye and mind. The tramp, which carries only freight, comes and goes unnoticed in the news columns of the public press; the traveling layman does not have his attention called to them; they do not carry his mail, his baggage or his person.

It may even with truth be alleged that in many cases these British tramp steamers carry a larger engineer department force than is to be found on American steamers of like tonnage. This arises from the fact that British steamers trading to the Orient carry almost exclusively Chinese or Lascar firemen, coal passers, etc., while

American ships do not. Fire-room crews on American ships, being much more competent, do not require the same number of men, of course. With a fire-room crew of say 20 Lascars, at \$15 per month, if the number of the crew alone is to be considered, it is not a true criterion to make a comparison with an American ship of the same type, carrying a less number, at rates of wages approximating three times as much. For example, the monthly wages paid on ships out of the port of New York, in the lines on the Atlantic coast and to the West Indies and South America, dependent upon the size of the ship and the requirements of the service, range as follows: Captains, from \$200 to \$300; first mates, from \$110 to \$125; second mates, from \$80 to \$95; third mates, from \$60 to \$85; boatswains, from \$35 to \$45; quartermasters, from \$35 to \$45; lookouts, from \$35 to \$45; deckhands, from \$30 to \$35; chief engineers, from \$135 to \$175; first assistant engineers, from \$100 to \$110; second assistant engineers, from \$90 to \$105; third assistant engineers, from \$70 to \$85; oilers and water-tenders, from \$45 to \$55; firemen, from \$40 to \$45; coal trimmers, from \$30 to \$35.

On the American line steamers running across the Atlantic under the American flag, the wages are on a basis of about 15 per cent higher than these figures.

Closed Season on Lakes

On the Great Lakes, where there is a closed season of navigation, lasting about four months, the officers, who are engaged by the year, are paid about the same rates as on the Atlantic coast steamers; but as their crews are discharged at the close of navigation, the wages on these American steamers are somewhat higher.

On the Pacific coast, where wages generally in all occupations are on a higher basis than in the eastern states, the rates paid for shipping for all positions are considerably higher. Deck hands receive \$50, and, owing to overtime, payments average from \$75 to \$90, while the firemen receive \$55. These rates do not include the cost of subsistence, which is defrayed by all steamship companies.

These figures are much higher than the rates paid on the vessels of other nations, and the subsistence furnished on American ships is freely acknowledged to surpass anything provided elsewhere. If the cost of subsistence be added to these wage scales, they will be found to compare favorably, in fact, to exceed, the rates paid ashore in the same localities for analogous kinds of labor. Besides, the man aboard ship has more steady em-

Comparison of Tonnage and Power of Typical Steam Vessels

Name of vessel.	Gross tonnage.	Style No.	Machinery.		Indicated or shaft H. P.	No.	Boilers.	
			Cylinders and Turbines.	Size.			Style.	Press.
Gettysburg	558	1 Triple	18, 28, 45 x 30		1,000	2	C.R.T.B.	170
Brandon	1,062	1 Triple	18, 28, 45 x 30		1,000	2	S.B.	160
Vanadis	1,092	1 Triple	18, 29, 45 x 26		1,000	2	S.B.	...
Manna Hatta	1,103	1 Triple	18, 28, 45 x 30		1,000	2	.....	...
Algiers	2,294	1 Triple	17, 24, 42 x 30		900	1	.....	...
New York	2,589	1 Triple	17, 27, 42 x 30		750	1	C.R.T.B.	160
May	652	1 Triple	19, 31, 51 x 33		1,500	1	.....	...
Merrimack	2,546	1 Compound	26, 56 x 48		1,500	4	C.R.T.B.	150
Lewis Luckenback	3,101	1 Triple	26, 42, 68 x 45		1,200	2	S.E.S.B.	180
Ruth	3,102	1 Triple	22, 37, 60 x 42		1,300	2	S.E.S.B.	180
Jean	3,125	1 Triple	22, 37, 60 x 42		1,300	2	S.E.S.B.	180
Pleiade	3,753	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	C.R.T.B.	175
Noma	763	2 Quad'l's	17, 27, 32, 32 x 24		4,200	4	W.T.B.	250
Belfast	2,157		Turbines		4,000	1	.....	...
New Hampshire	2,395	1 Quad'l	28, 45, 51, 51 x 42		3,000	4	S.B.	160
Nevadan	4,409	2 Triples	19, 31, 54 x 42		3,000	2	C.R.T.B.	200
Medina	5,246	1 Triple	29, 49, 84 x 54		4,100	4	S.E.S.B.	200
Columbian	8,580	2 Triples	24½, 42, 65 x 45		4,000	4	S.B.	...
Cyprus	1,037	2 Quad'l's	16, 26, 30, 30 x 24		3,600	4	W.T.B.	225
New Hampshire	2,395	1 Quad'l's	28, 45, 51, 51 x 42		3,000	4	S.B.	160
Jamestown	2,898	1 Triple	25¾, 44½, 73 x 54		3,000	4	S.E.S.B.	190
Howard	3,581	1 Triple	28, 46, 72 x 48		2,500	4	S.E.S.B.	170
Manhattan	3,539	2 Quad'l	23½, 37½, 42, 42 x 36		3,500	3	S.B.	200
Madison	3,734	1 Triple	26½, 44, 74 x 54		3,300	4	S.B.	190
Texan	8,615	2 Quad'l	19, 28½, 41, 60 x 42		3,400	3	S.E.S.B.	215
Corsair	1,136	2 Quad'l	21, 33, 38, 38 x 30		3,000	2	S.B.	190
Hamilton	3,723	1 Triple	27, 44½, 73 x 54		3,000	4	S.E.S.B.	190
Nevadan	4,409	2 Triple	19, 31, 54 x 42		3,000	2	C.R.T.B.	200
Brandon	1,062	1 Triple	18, 28, 45 x 30		1,000	2	S.B.	160
Algiers	2,294	1 Triple	17, 24, 42 x 30		900	1	.....	...
New York	2,589	1 Triple	17, 27, 42 x 30		750	1	C.R.T.B.	160
Niagara	1,444	2 Triple	18, 28, 45 x 30		2,000	3	C.R.T.B.	160
Olivette	1,678	1 Triple	23, 36, 60 x 36		2,000	4	C.R.T.B.	160
Ruth	3,102	1 Triple	22, 37, 60 x 42		1,300	2	S.E.S.B.	175
Tyler	3,928	1 Triple	19¾, 33¼, 58 x 42		1,800	2	S.E.S.B.	200
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	C.R.T.B.	175
Governor Cobb	2,522	3	Turbines		5,000	6	S.E.C.R.T.B.	150
Tyler	3,928	1 Triple	19¾, 33¼, 58 x 42		1,800	2	S.E.S.B.	200
Hayades	3,753	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Old Colony	4,779		Turbines		5,000	1	.....	...
Medina	5,246	1 Triple	29, 49, 84 x 54		4,100	4	S.E.S.B.	200
Mexico	6,207	2 Triple	28, 46, 76 x 42		5,000	4	S.B.	160
Kentuckian	6,606	1 Quad'l	25½, 37, 53½, 78 x 54		2,500	3	S.B.	215
Columbian	8,580	2 Triples	24½, 42, 65 x 45		4,000	4	S.B.	...
Texan	8,615	2 Quad'l	19, 28½, 41, 60 x 42		3,400	3	S.E.S.B.	215
Merrimack	2,546	1 Compound	26, 56 x 48		1,500	4	C.R.T.B.	150
Lewis Luckenback	3,101	1 Triple	26, 42, 68 x 45		1,200	2	S.E.S.B.	180
Jean	3,125	1 Triple	22, 37, 60 x 42		1,300	2	S.E.S.B.	180
Hayades	3,753	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Grecian	2,827	1 Triple	25, 41½, 68 x 42		2,820	4	S.B.	170
Ruth	3,102	1 Triple	22, 37, 60 x 42		1,300	2	S.B.	180
Oleum	2,950	2 Triple	18, 28, 45 x 30		2,000	2	S.E.S.B.	180
Howard	3,581	1 Triple	28, 46, 72 x 48		2,500	4	S.E.S.B.	170
Iroquois	3,601	1 Triple	23, 36, 60 x 36		2,000	2	S.B.	163
Tyler	3,928	1 Triple	19¾, 33¼, 58 x 42		1,800	2	S.B.	200
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Hamilton (Original)	3,128	1 Triple	27, 44½, 73 x 54		3,000	4	S.E.S.B.	190
Hamilton (Lengthened)	3,723	1 Triple	27, 44½, 73 x 54		3,000	4	S.E.S.B.	190
Manhattan	3,539	2 Quad'l	23½, 37½, 42, 42 x 36		3,500	3	S.B.	200
Comanche	3,856	1 Quad'l	24½, 34½, 49½, 70 x 36		3,500	3	S.B.	200
Nevadan	4,409	2 Triple	19, 31, 54 x 42		3,000	2	C.R.T.B.	200
Kentuckian	6,606	1 Quad'l	25½, 37, 53½, 78 x 54		2,500	3	S.E.S.B.	215
Texan	8,615	2 Quad'l	19, 28½, 41, 60 x 42		3,400	3	S.E.S.B.	215
Madison	3,734	1 Triple	26½, 44, 74 x 54		3,300	4	S.E.S.B.	190
Tyler	3,928	1 Triple	19¾, 34¼, 58 x 42		1,800	2	S.E.S.B.	200
Pleiade	3,753	1 Triple	21, 35, 56 x 42		1,500	2	S.B.	175
Kentuckian	6,606	1 Quad'l	25½, 37, 53½, 78 x 54		2,500	3	S.E.S.B.	215
Vale and Harvard	3,737	3	Turbines		12,000	12	S.B.	155
Lyra	4,417	1 Triple	21, 35, 56 x 42		1,500	2	S.E.S.B.	175
Matsonia	9,728	1 Quad'l	35, 62, 81, 81 x 66		8,500	3	S.E.S.B.	250
Manchuria	13,638	2 Quad'l	30, 43, 63, 89 x 60		11,000	8	4S.E.-4D.E.S.B.	215
Massachusetts	4,779	2 Quad'l	26, 43, 51, 51 x 42		7,000	8	S.E.S.B.	185
Old Colony	4,779		Turbines		5,000	1	.....	...
Medina	5,246	1 Triple	29, 49, 84 x 54		4,100	4	S.E.S.B.	200
Mexico	6,207	2 Triple	28, 46, 76 x 42		5,000	4	2S.E.-2D.E.S.B.	160
Columbian	8,580	2 Triple	24½, 42, 65 x 45		4,000	4	S.B.	...
Texan	8,615	2 Quad'l	19, 28½, 41, 60 x 42		3,400	3	S.E.S.B.	215
St. Louis	11,620	2-6 cyl'ds	28½, 28½, 55, 77, 77 x 60		22,000	10	6D.E.-4S.E.S.B.	200
Manchuria	13,638	2 Quad'l	30, 43, 63, 89 x 60		11,000	8	4D.E.-4S.E.S.B.	215

ployment; there is no deduction for time lost on account of sickness during the period of his term of engagement; when trade is dull, the ships must carry the same complement of crew as when she sails fully loaded.

Of the total gross tonnage of ships under the American flag, but one-eighth is registered for trading with foreign countries, the remaining seven-eighths comprising our coastwise, lake, bay, sound and river steamers. In the case of the American lines engaged in international trade, the rates charged for the carriage of freight are subject alone to the law of supply and demand, the unusually high rates now prevailing being due to the withdrawal of so many British ships for government service and the practical elimination of the whole German and Austrian overseas fleets, causing an unprecedented demand for the few American ships of this character. Any increase made to the cost of operation of such steamers by legislative enactment or otherwise can, therefore, as in the case of the output of industrial concerns, be shifted to the consumer by an increase in the rates of freight. This cannot be done, however, in the case of the cargoes carried by the other seven-eighths of our shipping, which is subject to an entirely different set of conditions. Almost all of the latter shipping is paralleled by railroads, with which they are in fierce competition throughout the territory served by them, and to hold any part of the traffic it is absolutely necessary that the rates of freight be placed at lower figures than are quoted by the railroads. While it is true that the water carrier has no roadbed to maintain, the steamer is a much more costly unit of earning power than has to be furnished by the railroad, ranging in value from the cargo steamship of \$300,000 to the express freight and passenger vessel of about \$1,000,000, for which the cost of marine insurance must be provided to cover the water hazards of cargo and ship, and which is not incurred by the rail carrier.

The rates for freight carried by our domestic steamships within the United States, comprising by and large about 75 per cent of the whole cargo carried, are subject to control by the interstate commerce commission, with all that this implies, and the rates between the ports reflect this control. The rates in effect by the railroads in competition with these steamers are also, of course, controlled by the commission.

As evidence of the effect of this railroad competition on our steamship enterprises, it is only necessary to

refer to the case of the steamboat traffic on the Mississippi river. Forty-five years ago there were 470 steamboats plying regularly on this river. At present, one would have hard work to find 47. Through packet service between St. Louis and New Orleans ceased in the early nineties of the last century, and about 10 years later through freighting practically ended. Several of the steamers formerly plying on this river carried from 5,000 to 9,000 bales of cotton, their tonnage being about 1,500 gross, and their length about 300 feet. There are no such steamers there today.

Even before the civil war these boats were known to make a speed of about 20 miles an hour. A record

passage, made in July, 1870, covered 1,278 miles from New Orleans to St. Louis in three days, 18 hours and 14 minutes, a sustained average speed of more than 14 miles an hour against the current. The Mississippi and Missouri, with their tributaries affording 16,000 miles of navigable waterways and touching 10 states, are of little use to this country as a means of transportation.

It is manifestly unfair to base any claim for a permanent increase in the number of men required by law to operate all ships, on the contention that a mere fraction of our shipping has been enabled, through war conditions, to temporarily increase its earning power.

Follow the Outside Course

THE question of following the outside course on the Great Lakes was brought up at a recent meeting of the Great Lakes Protective Association and it developed that there has been more or less laxity in this regard on the part of some vessels during the present season. Since the two courses were established three years ago, a great majority of the masters have followed them faithfully, but for some reason or other a number of downbound vessels have not followed the outside course this season. The violations are principally on Lake Superior. The outside course was established purely for safety and it has been endorsed by every vessel owner on the lakes. In a recent issue of the *Bulletin* of the Lake Carriers' Association it is stated that the master who departs from this rule does so without authority and upon his own responsibility. Why he should do so is not readily understood as he is jeopardizing property that is not his own and he is also risking his own position.

It is believed that as high as 25 per cent of the vessels have upon occasion failed to observe the outside course on Lake Superior during the present season and so aroused is the association over these conditions that steps were taken to discover the violators and when found guilty to put them on the dock for 30 days without pay. The mere proof of guilt will be sufficient cause for imposing the penalty. It will be quite another matter should any accident occur by reason of violation of this rule. In that event the consequences to the master will be quite serious.

The following letter was drafted and has been sent to all lake masters:

"Numerous reports of non-observance of outside courses downbound and inside courses upbound in Lakes Superior and Huron make it highly necessary to take immediate and positive action to prevent this dangerous practice.

"Each of the following fleet managers has declared his intention to suspend for 30 days without pay, the master of any vessel in his fleet for failure to adopt and follow such courses, and necessary means for reporting such cases have been adopted."

The letter was signed by those present at the meeting, including H. Coulby, J. H. Sheadle and Capt. C. L. Hutchinson, and was submitted later to all others owners in the association.

Commissioner Complains

One of the shipping commissioners on the Great Lakes calls the attention of vessel masters to the fact that orders for men to fill vacancies on ships plying the lakes often come from those who are not authorized to give such orders. Such orders are rarely accepted by the commissioner who has found that in the few cases when they were received, the orders invariably have been wrong and have resulted in confusion and delay. The commissioner points out that a licensed officer often wants a man who is not available and must be secured from other ports. Particularly in such cases as these it is essential that a person of authority give the orders. He concludes his suggestions by stating that "There is no more important duty for the officers of a vessel than to get a proper crew and if the master or chief engineer cannot go in person or telephone personally he should send a note signed by himself clearly stating his wants."

Death Claims Ralph D. Williams

After Battling With Ill-Health for Over a Year End Comes Suddenly at Rumsey Park—Widely Known as Writer and Lake Expert

By George Smart

RALPH D. WILLIAMS, editor of *The Marine Review* for 15 years, died at his summer cottage in Rumsey park, near Cleveland, Monday, Aug. 14. Mr. Williams had been in poor health for several years and when, about 10 days ago, he was prostrated by typhoid-pneumonia, his weakened constitution was unable to resist the disease.

Mr. Williams was born near Nottingham, Eng., in 1868 and came to Cleveland when about 10 years old. He attended the public schools, but his schooling was ended early, for at about the age many boys start to college, he became a reporter on *The Cleveland Plain Dealer*, in the service of which paper he remained until 1900, working his way up from reporter to city editor, managing editor and Washington correspondent. In 1900, he resigned from *The Plain Dealer* and returned to Cleveland, becoming editor of *The Marine Review*, which position he held until June 1, 1915, when he retired on account of ill health. After that date, he was not actively engaged, but devoted limited time to statistical work for the Lake Carriers' Association. Mr. Williams was never married. In his long newspaper career, which was characterized by a vast amount of high grade work, two features were most prominent: his devotion to art and his advocacy of the plan of grouping all of Cleveland's great

public buildings. Perhaps the latter was the result of his love of art. Be that as it may, it was a great conception. Frank J. Pool, of the Cleveland Museum of Art, said recently: "I always considered Ralph Williams the originator of Cleveland's group plan. Well do I remember how, years ago, he and Fredric C. Howe, now United States commissioner of immigration, talked about the group plan at a little club to which we three and others belonged. They had the original plans drawn and submitted to the chamber

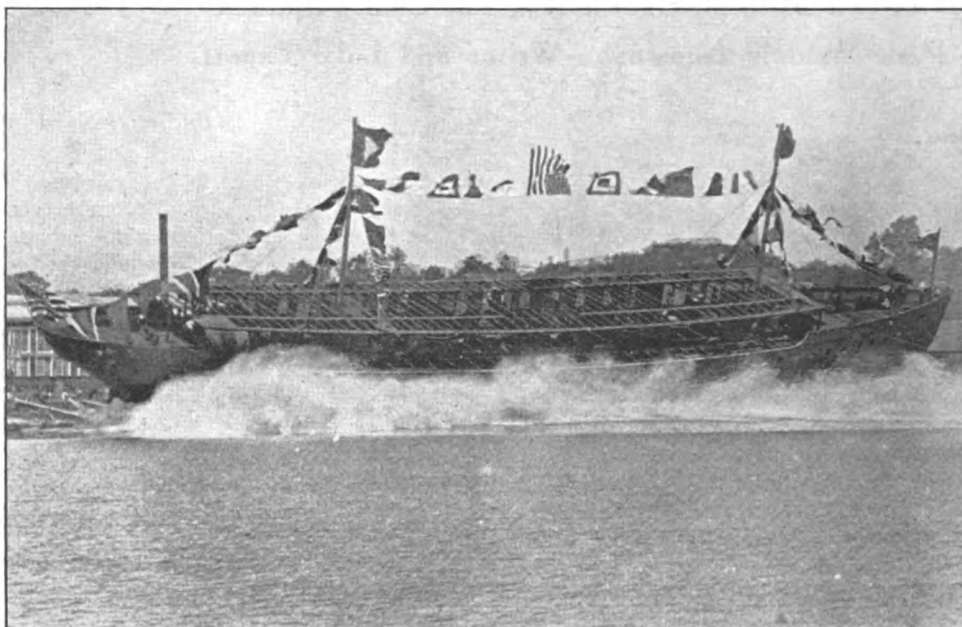
of commerce for its consideration." The love of the beautiful wherever found did not interfere with success in the thoroughly practical duties of an editor of a marine paper and during his 15 years of editorship of *The Marine Review* Mr. Williams became recognized as an authority on all matters relating to the Great Lakes. "He was thoroughly saturated with facts about the lakes," said J. H. Sheadle, vice president of the Cleveland-Cliffs Iron Co., when he heard of his death. "He was an unfailing source of information.

I feel that his loss is irreparable." But this trained newspaper man, this lover of the beautiful, believed that facts could be and should be, whenever possible, dressed in attractive words and the best exemplification of this belief is found in the book from his pen which was published in 1907, "The Honorable Peter White, a biographical sketch of the Lake Superior iron country." Mr. Williams did a prodigious amount of work in compiling the data for this book. It is full of facts, but there is not a dry page in it. It is a romance, a fascinating story of the marvelous development of the great ore deposits. It is a real contribution to the life of the Superior region, more valuable than countless tons of ore, for though ore will be smelted and disappear, this book will live an enduring monument to its talented author, Ralph D. Williams.



RALPH D. WILLIAMS

Photographs From Far and Near



SURVEYOR AND HER SPONSOR

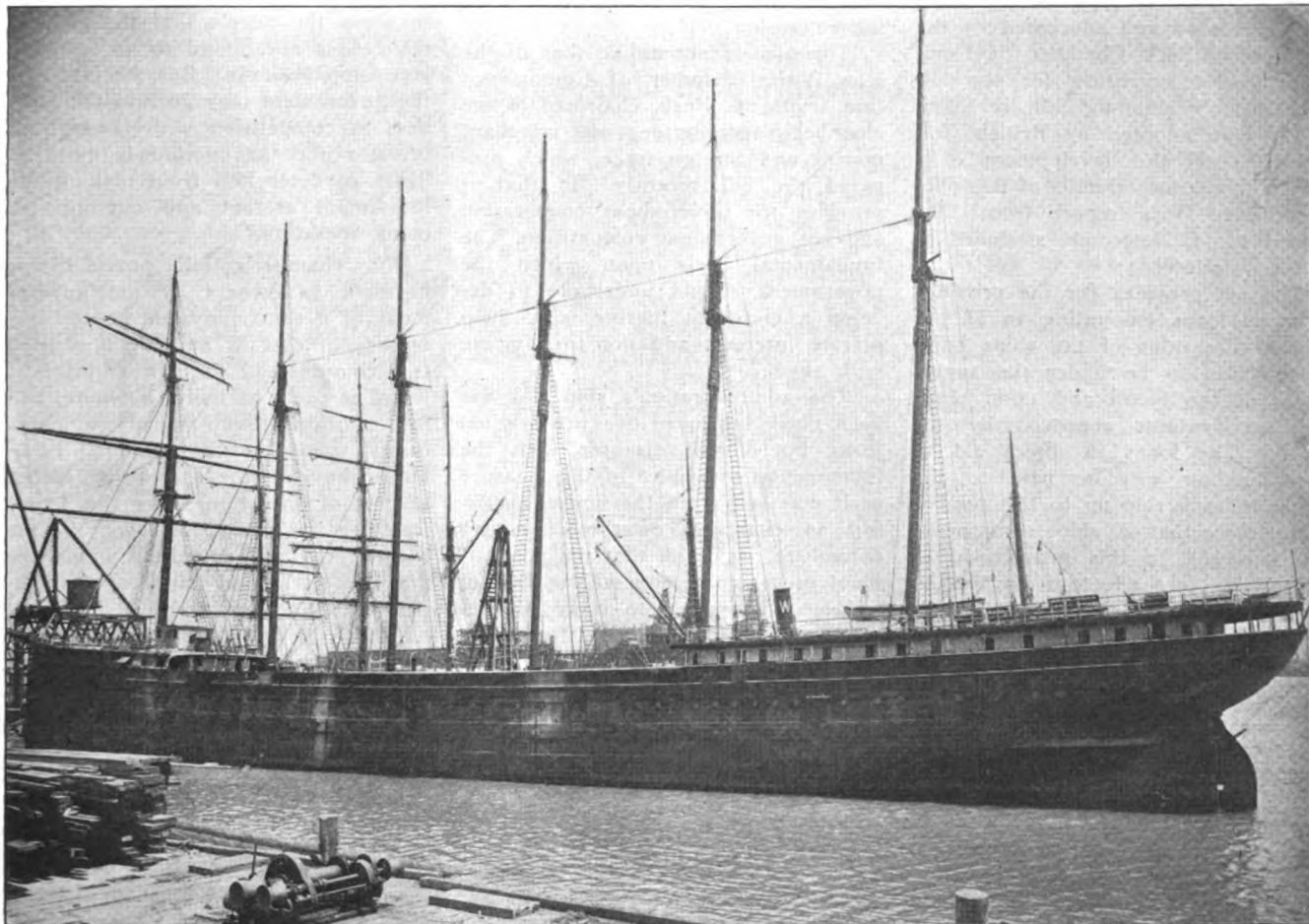
Miss Elizabeth Brent Jones, who christened SURVEYOR, is daughter of Dr. E. Lester Jones, a well known scientist. He was deputy commissioner of the U. S. bureau of fisheries before he was promoted to his present position as superintendent of the U. S. coast and geodetic survey. Descriptions of SURVEYOR, which is shown above as it entered the water, have appeared in previous issues of *The Marine Review*



VIEWS SHOWING DAMAGE TO MARQUETTE IN RIVER COLLISION

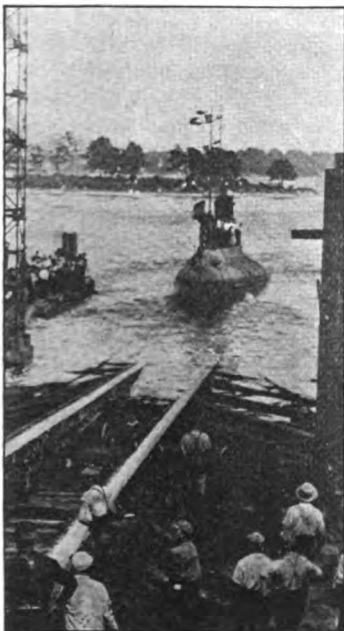
MARQUETTE lost her rudder and wheel and suffered serious injuries to her steering engine when she was struck by J. T. Kopp while running under check for the Livingstone channel. This is one of the most serious accidents to shipping which has happened so far this season on the Great Lakes. J. T. Kopp had a hole stove in her bow just above the water line.

Latest Marine News in Pictures



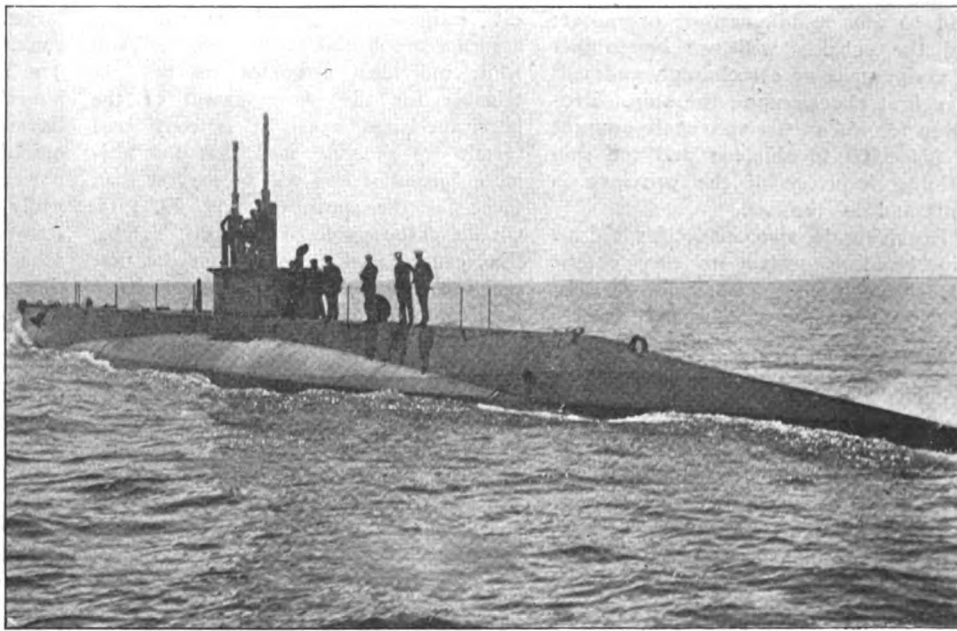
CITY OF SYDNEY IN BARKENTINE RIG

The old steamer, CITY OF SYDNEY which was consigned to the grave yard in the Oakland estuary six years ago, has been rejuvenated and converted into a modern six-masted barkentine. She is now bound for Australia with a cargo of 2,500,000 feet of lumber. She was built in New York in 1875, carried troops to the Philippines, and was transferred to a run between San Francisco and the orient.



Copyright by Boston Photo News Co.
A SPANISH SUBMARINE — ISAC PERAL—BEING LAUNCHED AT QUINCY, MASS.

After trials she will be turned over to a Spanish crew which will take her across the Atlantic.



Copyright by International Film Service

M1—THE LARGEST SUBMARINE BELONGING TO UNITED STATES ON HER OFFICIAL TRIAL TRIP AT PROVINCETOWN, MASS.

This new fighter is one of the first boats to be completed under the recommendation of the naval advisory board. Several more large submarines are now under construction and will be added to the coast protection fleet as they are completed. The trials were reported as being very satisfactory.

Province Aids Ship Building

CLOSE similarity to the ship bill prepared and advocated by the New York Chamber of Commerce, as a substitute for the administration's shipping bill, is found in the plan adopted by British Columbia to aid the development of a merchant marine. Details of this plan as outlined in a report from Vice Consul R. M. Newcomb, stationed at Victoria, follow:

"The act provides for the province to make loans amounting to 55 per cent of the value of the ships built, construction to be under the supervision of the board and upon plans and specifications approved by the board. The loans in direct aid to ship building will be paid to the owner of each ship up to the number of not more than 20 ships constructed and launched in this province after the coming into effect of the act, in 10 annual installments, each installment being computed so as to bring the net earnings of the ship, in respect of which aid is granted, up to 15 per cent of the actual cost. The subsidy paid in any one year, however, shall not amount to more than \$5 per ton deadweight capacity. The first annual payment will be made in the first year after peace is declared and thereafter annually. It is stipulated that this subsidy shall be paid only so long as the ship remains in continuous British Columbia service, that is, carries cargo from British Columbia and bring return cargoes to this province. No subsidy will be paid to any middleman or promoter; and the subsidy will not be subject to assignment or attachment, and will be a first charge upon the ship. Provision for aid to the aggregate amount of \$2,000,000 to shipping and the ship building industry of the province is contained in the bill.

"Provision is also made for aid to ship building plants to the extent that the commission may advance in securities to the amount of 55 per cent of the actual cost of such plant, as certified by the commission. Great care has been taken in providing for the conduct and operations of the commission, the first 43 sections of the act being devoted to that purpose. The commission will be a permanent body and have powers to own, buy, lease, manage, charter, build, rebuild and repair ships and all kinds of descriptions of property."

One company has already been incorporated to build ships in British Columbia as a result of this promise of government assistance, while an-

other concern has announced plans for expansion.

"The plan is not unlike that of the New York Chamber of Commerce," said Irving T. Bush, chairman of the chamber's committee on merchant marine and foreign trade, which prepared the bill recently, "in that it provides for government cooperation and not government competition. The fundamental basis upon which the government should undertake to develop a merchant marine is to help private interests and not to compete with them.

"The administration's ship bill has been much improved over its original form, but I still disagree with the fundamental principles of the measure as it emerged from the house. Speaking as chairman of the chamber's committee, we think that the appointment of a commission will be helpful and are not opposed to many features of the bill as it was sent to the senate. There is, however, one feature which it seems most unfortunate cannot be entirely corrected, and that is the power given to the government to operate steamships. The present pro-

vision, which makes it mandatory that the government cease all operations at the end of five years after the conclusion of the present war, is in the nature of a compromise to attempt to show the people that the government does not intend to go into the steamship business. But the fact that the government may go into the business in competition with the private investor for that period is quite as likely to deter him from making the investment as out and out government operation."

The chamber's bill provides for payment to owners by the government of a sum equivalent to the difference in cost of building a ship in this country and the lowest price at which it could be built elsewhere, and for additional semi-annual payments over a period of 20 years to reimburse the operator for the difference of cost of operation under the American flag and navigation laws, and the highest cost of operation under the flag or navigation laws of a competing country, which has a merchant marine, the aggregate tonnage of which exceeds or equals that of the United States, engaged in foreign trade, payments to be regulated and distributed by a federal shipping board.

Gulf Storm Damages Ships

By H. H. Dunn

LOSS to shipping on the American coast of the gulf of Mexico caused by a storm the early part of July will reach \$1,500,000 at the lowest estimate. Figures approximately accurate are beginning to come in, and while individual estimates are not obtainable for the entire extent of the hurricane-swept coast, it is considered certain by shipping men that the ultimate figures of loss will be greater than those for the storm of Sept. 29, 1915. On the eastern side of the gulf, Tampa, Fla., caught a slight blow, but the first real force of the hurricane exerted itself at Pensacola. Passing westward, Mobile, Pass Christian, Gulfport and Biloxi, with all the intermediate small ports and Ship island were forced to bear the brunt of the Caribbean sea gale. Fishing and oyster fleets at the mouth of the Mississippi river, still further westward, also suffered, more than 40 boats being piled at one time in the marshes extending from Pilot Town some 20 miles up the river. Galveston also felt one wing of the wind.

Pensacola's total damage is estimated at more than \$800,000, probably half of which was done to shipping in the harbor and to vessels which make the

Florida city their home port. Shipping damage at Mobile was close to \$750,000. In Mobile bay, the steamers JAMES A. CARNEY, BEAVER, PLEASURE, and the large power boat, J. T. ROWELL, were sunk, and probably will be total losses. The river steamer CITY OF MOBILE, was blown high and dry on her docks. Several thousand dollars will be required to repair her. Seven smaller power boats are reported sunk or so badly damaged as to be practically destroyed. Fifteen barges were blown ashore or sunk where they were tied up. Seven sailing vessels were sunk, in the harbor, and as many others badly damaged. The tug GULFPORT, which was in the Ollinger & Bruce dry docks, drifted, docks and all, from Pinto island, to come to rest against one shore of Mobile bay. Dry docks and steamer were undamaged. Practically every small boat, including the part of the fishing fleet which was in port, experienced damages from a few dollars to thousands. The damage to those ships at sea has not been learned.

In Pensacola, highest individual damage was suffered by the power cruiser CORINTHIA, owned by C. B. Fox. New

Orleans. With a fleet of five other power craft from the Southern Yacht Club, CORINTHIA was at Pensacola in the annual New Orleans-Pensacola cruise, when the wind, blowing at times as high as 104 miles an hour, hit the port. CORINTHIA suffered between \$3,000 and \$4,000 damage as a result of being slammed against the side of a steamer anchored to a wharf near her. The crew of the power cruiser fought the storm for more than 30 hours, without sleep or food. Prior to this, SHIRIN, the large power cruiser belonging to I. T. Rhea, New Orleans, and also in the race, rescued 35 men, women and children who had been marooned by the storm on Santa Rosa island.

Two schooners, with 70 boys from the Gulf Coast Military Academy on their annual cruise, were saved in Pensacola harbor by being beached. The schooners were badly damaged, but the boys were saved. Fishing schooners, pleasure steamers, tugs, and at least one big deep-sea barque, were sunk or driven on shore by the wind. J. E. Pierce, New Orleans, on SPITFIRE, which was in the power boat race, was saved from death and his boat from destruction by the sinking of a pile-driver barge between SPITFIRE and two large, lumber-laden schooners which were being driven down on the power boat by the wind. When the schooners were within 300 feet of SPITFIRE, the barge drifted between, was hit by the schooners and all three went to the bottom. Pensacola navy yard docks are reported wrecked, with heavy damage to four hydroaeroplanes.

At Gulfport, the loss to shipping will be nearly \$100,000, including Ship island damage and the loss of ships at sea which have not returned. The big schooner MARY G. DANTZLER, was lost with Capt. L. S. Foster, his bride of a few weeks, and the entire crew. She was loaded with phosphate rock and probably sank almost as soon as the 100-mile gale struck her. The schooner CHAMPION, belonging to A. Edwards, of Bay St. Louis, Miss., also is reported lost. The Norwegian ship ANCENIS, worth at least \$150,000, is a complete wreck off Ship island. The four-masted barkentine, JOHN W. MYERS, and the pilot boat E. E. BARRY, went ashore on Ship island and were badly damaged.

Probably a score of small boats, including the power schooners EMMA HARVEY, BEULAH D., and LABOBA, and the large schooner CAMBRIA, were lost. About 18 men are believed to have gone down with them. Only one man, Ramon Ray, a Spaniard, who was on board CAMBRIA, was saved. Other boats sank with full crews and some passengers. In addition to these it seems certain that DOXIE, EMILY and MATTIE J., fishing crafts, also perished. Ship island loss is put at \$150,000.

The total loss of life along the coast probably never will be known; especially in the isolated fishing villages, where the only connection with the outside world is by boat, but it must reach into the hundreds.

Wage Scale of Unlicensed Men Increased

The board of directors of the Lake Carriers' Association at a regular meeting held on Aug. 3, in recognition of the unusual conditions obtaining in industry generally, unanimously decided to make a horizontal advance of \$10 per month in the wages of all men aboard ship below the grade of licensed officers, effective Aug. 1. The summer schedule of minimum rates of wages for 1916, published prior to the opening of navigation, is therefore amended in this particular to read as follows:

Boatswain	\$80.00
Cooks, vessels over 4,000 gross tons...	110.00
Cooks, vessels under 4,000 gross tons...	95.00
2nd cooks	60.00
Waiters	50.00
Porter	45.00
Firemen, oilers and water tenders....	70.00
Wheelmen-lookoutsmen	70.00
Ordinary seamen	47.50
Coal passers	45.00

Barges.

Mates on barges not less than ten dollars (\$10.00) per month more than seamen on the same vessel; and donkey men five dollars (\$5.00) per month more than seamen.

Mates' wages on tow barges of the large class (vessels which paid their mates \$73.00 a month last year) \$90.00 per month.

Able-bodied seamen on tow barges \$70.00 per month.

The engineers on tow barges carrying towing machines \$90.00 per month.

The cooks on tow barges the same wages as the seamen on the same barges.

Ordinary seamen on barges \$47.50 per month.

It was also recommended that the question of additional remuneration for the licensed officers be taken up at a meeting of vessel owners to be held later and it was the sense of the board of directors that just recognition should be given to their efficiency under the exacting conditions obtaining this year and that the additional compensation for licensed officers should take the form of a distribution from profits at the close of the season.

It was also decided that the coal passers should be worked in three shifts on all boats upon which it is practical to do so and that they should be regarded as part of the engine room crew.

Ore Movement Breaks Records

The movement of 9,750,157 gross tons of iron ore from the Lake Superior district during July, established a new record for monthly shipments on the Great Lakes, being 242,581 tons in excess of the record made in June, and 1,300,577 tons greater than the record made in May. Shipments for the season up to Aug. 1 aggre-

gated 29,365,724 tons, compared with 24,329,460 tons shipped to Aug. 1, 1913, which was record year in the ore trade. If shipments during the remainder of the season equal those for the same period in 1913, the total movement for the season will be over 54,000,000. However, considering the monthly gains which have been made so far over the 1913 movement, together with the favorable conditions obtaining all around in the ore trade, it is estimated that the 1916 movement will approximate 55,000,000 tons.

Following are the shipments by ports, with corresponding data for 1915:

Port.	July, 1915.	July, 1916.
Escanaba	813,870	1,044,368
Marquette	567,358	680,779
Ashland	708,285	1,302,682
Superior	1,286,402	1,986,631
Duluth	2,414,649	3,012,492
Two Harbors	1,413,456	1,723,205
Total	7,204,020	9,750,157
1916 increase		2,546,137

Port.	To Aug. 1, 1915.	To Aug. 1, 1916.
Escanaba	2,062,700	3,647,192
Marquette	1,114,360	1,834,919
Ashland	1,870,077	3,506,945
Superior	3,064,002	5,865,546
Duluth	6,710,460	9,338,482
Two Harbors	3,903,704	5,172,640
	18,725,303	29,365,724
1916 increase		10,640,421

Soo Canal Commerce

The report of the superintendent of the Sault canals for July shows that 14,048,404 tons of freight passed through the Canadian and American canals during that month. This movement is the heaviest for any one month on record, exceeding the previous record, made in June, by 1,087,935 tons. Vessel passages during July numbered 3,938, an average of 127 per day. A summary of the total movement of freight through the canals up to Aug. 1 is published herewith.

EAST BOUND.

	To Aug. 1, 1915.	To Aug. 1, 1916.
Copper, net tons.....	63,290	44,854
Grain, bushels	16,788,171	43,063,265
Bldg. stone, net tons..		
Flour, barrels	3,068,037	3,426,777
Iron ore, net tons.....	18,097,758	28,046,522
Pig iron, net tons.....		17,015
Lumber, M ft. B. M....	218,203	138,985
Wheat, bushels	38,626,478	116,031,294
Unclass. frt., net tons.	131,919	99,892
Passengers, number ..	12,475	12,956

WEST BOUND.

Coal, anth., net tons..	994,226	983,458
Coal, bitu., net tons..	4,781,615	6,733,159
Flour, barrels	100	13,165
Grain, bushels	31,250	2,560
Manuf. iron, net tons.	95,595	76,472
Iron ore, net tons.....		17,503
Salt, barrels	297,406	374,072
Unclass. frt., net tons.	474,203	592,859
Passengers, number ..	11,937	12,196

SUMMARY OF TOTAL MOVEMENT.

East bound, net tons..	20,472,730	33,057,028
West bound, net tons..	6,390,641	8,460,683
	26,863,371	41,517,711
Vessel passages	8,547	11,535
Registered tonnage ...	21,519,915	31,803,886

Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE German vessel KAISER WILHELM II was at Southampton, England in the months of June and July, 1914, and had certain repairs made by, and received certain necessary supplies from, a British corporation. The vessel then proceeded to this country, and while at dock the European war broke out. Thereupon libellant filed a libel *in rem* for the repairs and supplies, and it was held, in the opinion reported in 230 *Federal Reporter* 717, that as neither the laws of England nor those of Germany, which were pleaded, give libellant a lien or right to proceed directly against the vessel, the suit could not be maintained, although in the absence of a showing of such foreign laws our own law would be applied. It appears, from the decision, that the German government, by decree of Sept. 30, 1914, forbade its subjects from making any payments to British subjects, and that on Sept. 9, 1914, the British government promulgated a similar decree, and parliament shortly after passed a statute, known as the Trading With the Enemy Act. In view of these decrees, it was said that a court of admiralty of the United States, in a case where its action is discretionary, will refuse to entertain jurisdiction of a suit between subjects of the two countries to enforce payment of a claim arising in a foreign country.

"Due care requires," it was said in the case of GOVERNOR, 230 *Federal Reporter* 857, "that the judgment of the officers when dealing with injured seamen should be exercised, not only with such knowledge as they possess, but also with such as they can readily acquire." It was held in the above case that failure to call a physician until 11 hours after the injury, one being available an hour thereafter, constituted negligence rendering the vessel liable in damages.

New York Central No. 18, 230 *Federal Reporter* 299, decides that the starboard hand rule applies to a boat which is approaching on a crossing course, and which must pass other boats in motion and affected by the tide, even though they do not seem to be navigating in a definite direction at the time. A drifting boat, with power available, is responsible for any effect of her movements undertaken while drifting, unless a proper signal is given.

A tug which went to the assistance of a steamship stranded on a reef, and for more than 50 hours pulled constantly, rendering valuable service in preventing the swell from driving such ship further on the reef, was held entitled to salvage, in the case of CELTIC CHIEF, 230 *Federal Reporter* 753, though her hawser was cut and she was discharged from further service on refusal

of request of master of the ship to give her place to a larger vessel, she, however, continuing to stand by.

A vessel which undertakes a towing service is not an insurer of the safety of the tow. It meets the full measure of its obligation if it is reasonably adequate to the towing service, and is in charge of men who possess and exercise the skill and care ordinarily exercised by those having experience in like service; and where the master is shown to be experienced and competent, much must be left to his judgment and discretion, and the burden rests on the owner of the tow to prove that loss or injury thereto resulted from negligence on the part of the tug.—Hardy, 229 *Federal Reporter* 985.

Where all hands on a fishing vessel ship on the lay, but the cook is to receive an extra of a certain sum per day or month, the extra wages due the cook, it was held in METTACOMET, 230 *Federal Reporter* 308, are a preferred charge against the catch, and, in the absence of any different agreement, the vessel is not liable therefor, where there was no catch. And where an owner lets his vessel to a master on a lay by which master and crew are to pay all running expenses, and master ships his own crew, they are not partners with the master in the enterprise, so as to be liable with him for advances made to him by the owner for running expenses.

The Harter act was involved in the case of COASTWISE, 230 *Federal Reporter* 505, and the court presented the question as follows: "The owner of a barge charters her to carry a cargo between ports. He provides a tug, also belonging to him, to tow her. Both barge and tug are seaworthy, and are properly manned, equipped, and supplied. The barge and her cargo are totally lost by negligence in operating the tug. Does the Harbor act relieve the tug from liability?" The court then cited the case of Baltimore & Boston Barge Co. vs. Eastern Coal Co., 195 *Federal Reporter* 483, and decided that such act did not apply, and that the tug was liable for loss of the cargo.

The case of Brooks et al vs. Hilton-Dodge Lumber Co., 229 *Federal Reporter* 708, holds that where a cargo of lumber was purchased from a charterer to be delivered at the purchaser's wharf under an agreement to supply "suitable berth on arrival for receipt of the lumber in accordance with rules of port", the purchaser was bound not only to furnish a suitable berth but also to do nothing to prevent receipt of the lumber from the vessel in accordance with the rules of the Maritime Exchange, and it is liable to the charterer for demurrage

it was required to pay because of delay caused by the purchaser. In the same case it was said that in the absence of agreement to the contrary, it is the duty of the vessel to load and discharge cargo, and such duty should not be transferred to the charterer, unless the intention of the parties to do so is clear.

Whiskey is not necessary for the navigation of a ship, it was decided in STERLING, 230 *Federal Reporter* 543. That case involved a construction of the act of Congress (Comp. St. 1913, section 7783), which gives a lien for supplies, libellant contending that certain liquors which he furnished for use by the crew of the fishing boat STERLING were necessities. The court said: "The term 'necessaries' includes whatever is fit and proper for the service upon which the vessel is engaged or whatever would have been ordered by a prudent owner, if present. It is sufficient if the articles form part of the actual and reasonable outfit of the vessel for the business in which it is engaged. Supplies may be considered of two classes: First, those which are necessary to the navigation of the ship; and, second, those necessary for the venture in which the ship is engaged. Sufficient food, suitable clothing, proper shelter, and such luxuries as contribute to the comfort and convenience of the seamen are necessities. While these seamen may have the habit and desire to consume spirituous liquors, other seamen might have other desires craving to be satisfied, and can it be said that the rule is so flexible as to be adjusted to the habits or desires of seamen, rather than necessities for the navigation of the ship, or for the safety and comfort of the crew?"

Cancellation of a charter party and withdrawal of a vessel from a charter party are not the same, it was decided in Luckenbach vs. Pierson, 229 *Federal Reporter* 130. Withdrawal of a vessel means that the owner shall deprive the charterer of any further enjoyment or use of the vessel and take it into his own exclusive possession. This can be done, even where the vessel is at sea, provided she is light; but if there be any cargo on board no withdrawal can be made until the cargo be relanded if the vessel is at the loading port, or until it be discharged if she is at sea or at destination.

A charter calling for \$72,000 a month, believed to be one of the highest ever written for a vessel, was obtained recently for the steamer KANSAS, owned by the American-Hawaiian Steamship Co. KANSAS has been under charter to the France-Canadian line, engaged in carrying supplies to St. Nazaire.

What the Government is Doing

Rulings on Marine Matters

Improvements to Waterways

Hints to Navigators

Shipping Bill Expected to Pass

CHANGES made by the senate committee on finance in the administration ship purchase bill have undoubtedly gained added support for it in the upper branch of congress. Its passage and final enactment at this session of congress is confidently predicted by administration officials. While the Republicans in the senate have said they would not filibuster against the bill, prolonged debate on the measure seems probable.

Most, if not all, of the Democratic senators who opposed the bill when it was in the senate during the sixty-third congress, are understood to have been whipped into line by reason of amendments the finance committee adopted. The bill was approved at the Democratic caucus, which, however, was not made binding. The principal and most significant feature of the caucus was the little pleasantry that passed between Senator Stone, of Missouri, who has consistently supported the shipping bill, and Senator Clarke, of Arkansas, who has been its most vigorous opponent on the Democratic side. These two senators engaged in a hearty handshake after the caucus session was over.

Latest Amendments

The chief amendments made in the bill by the finance committee, which have brought recalcitrant Democrats into line, are:

Elimination of the secretary of the navy and the secretary of commerce as ex-officio members of the board.

Imposition of limitations upon the powers of the shipping board so that neither the board nor any corporation, formed under section 11, in which the United States is then a stockholder shall purchase, lease or charter any vessel—

(a) Which is then engaged in the foreign or domestic commerce of the United States, unless it is about to be withdrawn from such commerce without any intention on the part of the owner to return it thereto within a reasonable time;

b) Which is under the registry or flag of a foreign country which is then engaged in war;

(c) Which is not adapted, or cannot by reasonable alterations and repairs be adapted, to the purposes specified in the section:

(d) Which, upon expert examination made under the direction of the board, a written report of such examination being filed as a public record, is not without alteration or repair found to be at least 75 per cent as efficient as at the time it was originally put in commission as a seaworthy vessel.

While the board is given the power in section 5 to construct, purchase, lease or charter, and in section 7 to charter, lease and sell vessels so purchased, constructed or transferred, it is nowhere in the act given power to operate these vessels. The only authority to operate vessels either built, purchased or leased under the act through a governmental agency is found in section 11. This section empowers the board—if, in its judgment, such action is necessary to carry out the purposes of the act—to form one or more corporations with a total capital stock of not exceeding \$50,000,000, and authorizes the government to subscribe, through the board, for not less than a majority of the stock. These corporations are empowered to purchase, construct, equip, lease, charter, maintain and operate merchant vessels in the commerce of the United States.

Endangers Coastwise Trade

The objections which have been made to this act, based upon the ground of governmental ownership and operation, grew out of the power of operation given these corporations in this section. By way of concession to these objections, the house bill incorporated in the act a provision limiting the operation of vessels on the part of such corporations to a period of five years from and after the close of the European war. The senate bill further limits the authority

of such corporations so that they may not operate the government vessels in foreign trade unless it is impossible to lease such ships to private interests. The vessels may engage in coastwise trade, which means that business is opened up to foreign built vessels acquired by American citizens under the act. The jurisdiction of the shipping board is limited to vessels on the high seas and on the Great Lakes. The power to register the vessels as naval auxiliaries was eliminated. When in times of war the government commandeers American vessels, compensation therefor shall be based upon normal conditions.

Vigorous opposition has been made by Republican senators against that feature of the bill permitting foreign built vessels owned or operated by the government or leased or sold to private firms or corporations to engage in the coastwise trade. Fear is expressed that such a provision will demoralize the coastwise trade of American ships and greatly injure the business of American ship yards.

While the consensus of opinion of shipping interests appears to be that the senate measure is an improvement over the house bill, most of them are still strongly opposed to it and point out that its principle, that of government ownership and operation of vessels, remains unchanged. They also claim that the power given the board to regulate rates, practices, etc., of vessels is entirely too severe.

Want Standardized Ships

Both the house committee on merchant marine and the senate committee on finance have supported the idea that the American merchant marine should be built up through a system of building standardized ships. The suggestion that this be done has come from H. Platt Stratton, of the American Bureau of Shipping, New York City, and from naval constructors. They have said that the great steel plants of this country should take hold of the matter and co-operate to bring about this end. It is the

idea of those advocating the plan that they, through duplication of parts, can make it possible within two years to launch vessels of from 1,000 to 5,000 tons cargo capacity in many sections of the country. Mr. Stratton has said that there are many wooden ship yards on the coast, bays and tributaries where the assembly of ships could be advantageously conducted, with far less difficulty and much more expedition than our ocean-going fleet of a half century ago was hewn out and assembled from material existent within our forests."

Naval constructors are understood to be at work on plans for battle cruisers provided for in the naval bill and merchant vessels provided for in the shipping bill, having in mind the adoption of a system of standardized ship building. The merchant ships being planned are said to call for a cargo capacity of 10,000 tons. These vessels could be built either in United States government yards or in private yards in this country or abroad. It is the opinion of supporters of the shipping bill that the \$50,000,000 which it appropriates, would provide from 500,000 to 700,000 tons of merchant vessels.

Lake Erie Ore Receipts

Out of a total movement of 9,750,157 tons of iron ore shipped during July 7,681,084 tons were received at Lake Erie ports, distributed as follows:

Port.	Gross tons.
Buffalo	1,174,378
Erie	194,616
Conneaut	1,437,320
Ashtabula	1,696,622
Fairport	401,097
Cleveland	1,657,510
Lorain	610,967
Huron	167,940
Toledo	309,509
Detroit	31,125
Total	7,681,084

Prominent Lake Shipper Dies

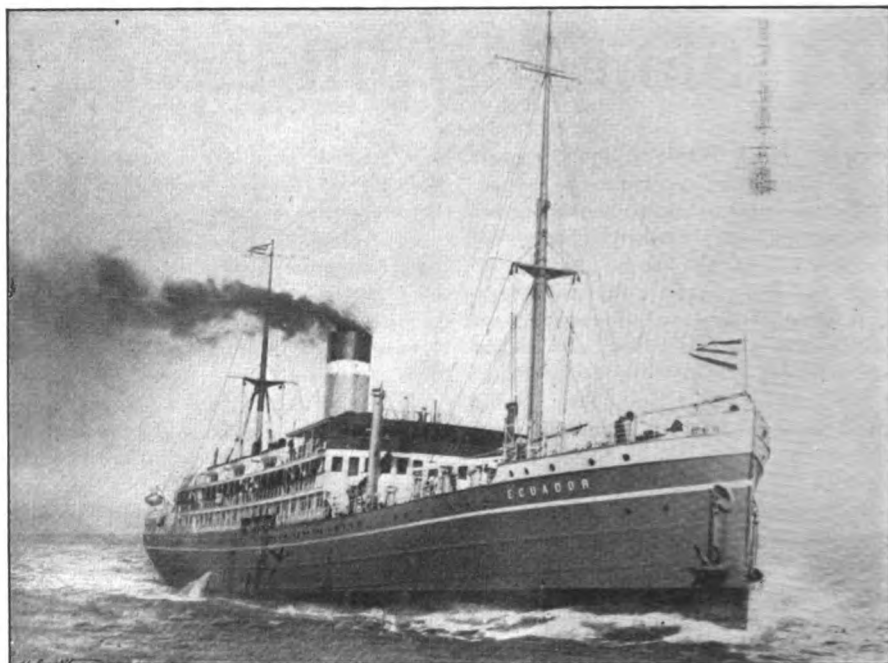
John P. Reiss, well known lake shipper of Sheboygan, Wis., died suddenly of heart failure at his desk at the C. Reiss Coal Co., on July 21. He was born in Sheboygan and was 41 years old at the time of his death. His entire life was spent in Sheboygan, where he was associated with the C. Reiss Coal Co. for the last 23 years, holding the office of vice president and treasurer for the past 10 years. His maritime connections included a similar office in the Reiss Steamship Co. and a directorship in the North American Transportation Co., Cleveland. Mr. Reiss is survived by three children.

New Fleet for Pacific

THE Pacific Mail Steamship Co., formerly operated by the Southern Pacific railroad, has been returned to the Pacific trade by its new joint owners, the American International Corporation and W. R. Grace & Co., New York. The line recently purchased

their new route will be Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.

The Pacific Mail Steamship Co. is the oldest ocean steamship company in this country and, at one time, was the largest steamship company in the world. The



PACIFIC MAIL OIL-BURNER ECUADOR OFF ATLANTIC TERMINAL, BROOKLYN, JULY 17, ON HER WAY TO SAN FRANCISCO

from the Dutch West Indies Steamship Co. the steamers ECUADOR, VENEZUELA and COLUMBIA, with the intention of converting them into oil burners and operating them out of San Francisco. The work of converting the ECUADOR was completed at the plant of the Robins Dry Dock & Repair Co., Brooklyn, early in July. ECUADOR was thrown open for inspection at the Atlantic Terminal, Brooklyn, July 17, left for San Francisco July 19 and will sail from that port on Aug. 19 on her first trans-Pacific trip. The VENEZUELA, which now is being converted at the Robins yards, is scheduled to sail from San Francisco Sept 16 and COLUMBIA, which is being converted in Amsterdam, Holland, is scheduled to sail from San Francisco Oct. 7.

These vessels, which are sister ships, were built in Holland in 1915 and made but one voyage each before they were acquired by the Pacific Mail Steamship Co. Each has 10,000-tons displacement, registered gross tonnage of 5,688 tons, and is 396 feet long, 48 feet 6 inches wide, and 35¼ feet deep. The vessels are of steel construction and have speed of 14 knots an hour. Each is licensed to accommodate 111 cabin and 78 steerage passengers. The ports of call on

company was organized in 1847 and immediately built a number of vessels in New York which were put into the Pacific trade in 1848. The company maintained a Pacific fleet until late in 1915, when, due to the restrictions of the La Follette seamen's act, it disposed of its steamers MANCHURIA, MONGOLIA, KOREA, SIBERIA and CHINA to the Atlantic Transport Co. for the sum of \$5,250,000. Early in 1916, following the change in ownership of the majority of the capital stock, the policy of the company was changed and it was decided not only to retain the seven remaining steamships, AZTEC, CITY OF PARA, NEWPORT, PERU, SAN JOSE, SAN JUAN and PENNSYLVANIA, but to re-enter the Pacific trade. ECUADOR, VENEZUELA and COLUMBIA accordingly were acquired at an approximate cost of \$1,100,000, each.

The decision to revive the trans-Pacific trade of the company largely is in the nature of an experiment. If successful, a fleet of large new ships will be put on the Pacific. Under present conditions in ocean commerce, the officers are strongly inclined to expect success, as evidenced by their willingness to make the venture. The three ships now being put into the Pacific trade, it is probable, ultimately will go into the Central American trade.

Effect of Seamen's Act on England

An Analysis of the Situation Faced by British Ship Owners Due to the La Follette Law

EVER since the seamen's bill loomed on the horizon of prospective legislation, mercantile interests in Great Britain have oscillated between hopes and fears as to its final form and destiny. Now that the act is *un fait accompli*, shipping people on this side of the Atlantic, being obliged to submit to the inevitable, are still more or less perturbed as to its ultimate effect upon the carrying trade.

The measure is stated, in its preamble, to be: "An act to promote the welfare of American seamen * * * and to promote safety at sea." Did the measure not stray beyond the limits of most worthy objects the owners of foreign shipping could have nothing to say, but a law which interferes so much with the rights and liberties of the personnel of the ships of other nations cannot fail to arouse the adverse commentary of the maritime interests thereof. It is, perhaps, beyond the mark to criticise legislation other than our own, but it may be of interest to American readers, nevertheless, to learn the views of the outsider whose interests are involved in the enactments of their state.

Inviting Trouble

Section 4 is the first portion of the act affecting foreign shipping. One wonders if American legislators have ever considered that they were inviting trouble in the ports of their own country when they enacted that a sailor on board other than American ships which have lain in port five days still have the right to demand half the wages he has earned during the period since the vessel was last in port? It is the experience of those associated with the mercantile marine of this country that whenever ships' crews handle a portion of their wages—as for instance in the case of the advance given before sailing—no small proportion of the money finds its way to the gin shop in not a few instances, and failure to join or desertion frequently ensues.

The British board of trade has taken extraordinary precautions to discourage the seaman from laying hands upon his earnings and squandering them when he is away from his native place. When, therefore, a port of discharge is not the seaman's home port, he is granted special facilities for sending money orders, obtained at the shipping office, free of charge, home to his wife or relatives.

Many people connected with shipping on this side are speculating as to the

effect of giving seamen in American ports, in the middle of a long voyage, an opportunity to thus squander their substance. It may be that the answer will lie in the future experience of the United States local courts of correction. One thing seems clear, however, the relatives of British seamen will be the sufferers.

Advance of Wages

While it has been the rule of American law to prohibit an advance to seamen on account of wages at the commencement of a voyage it is a familiar practice of British routine to grant advance notes for half a month's wages,

An official of one of the important British steamship associations has prepared the accompanying survey of the LaFollette seamen's act and its probable effect on foreign ship owners. While emphasizing the fact that the full effect of the law can not be determined for some time, he points out the collisions that will inevitably occur between this law and the regulations of other nations. The author gives particular attention to the question of wages, and concludes that the LaFollette law will encourage the seamen to squander their earnings.

payable three days after the ship sails, which the seaman may either leave with his relatives or negotiate prior to sailing in order to furnish outfit, etc. As may be readily seen this practice has its drawbacks, and is capable of much abuse by the seaman. But that is scarcely the point. By section 11 of the act the law which makes it illegal to provide for the advance payment of wages, and likewise to issue allotment notes to any but certain specified relatives of seamen, is made applicable to foreign ships visiting United States ports. While it seems inconceivable that the fines and penalties attaching to the infringement of this regulation will be inflicted in respect of advance notes which have been given to seamen engaged at a British or continental port, or in respect of allotment notes granted, as in the usual British practice, to persons outside the limits prescribed by the act, it does seem that when taking advantage of section 4 and claiming one-half of the wages earned, the seaman will be under no obligation to give credit for the advance which, in all probability, will have been made to him at the British or continental port of

engagement. This anomaly will, no doubt, be capable of adjustment at the final British or continental port of discharge when the wages account is made up, but it is conceivable that there may be cases in which the balance due to the seaman will be insufficient to cover the original advance.

But wherein the application of this law will definitely and directly hit the British ship owner is in the event of an action in the United States courts by the seaman for the recovery of wages.

The section reads: "The payment of such advance wages or allotment shall in no case except as herein provided, absolve a vessel or the master or the owner thereof from full payment of wages after the same shall have been actually earned, and shall be no defense to a libel suit or action for the recovery of such wages."

The United States court, under the circumstances, would not recognize the validity of any advance or allotment made at a foreign port.

Qualification of Personnel

Section 13 enacts that no ship shall be allowed to depart from any port in the United States unless she has on board a crew (1) not less than 75 per cent of which, in each department thereof are able to understand any order given by the officer of such vessel; nor (2) unless 40 per cent in the first year, 45 per cent in the second year, 50 per cent in the third year, 55 per cent in the fourth year after passing of the act and thereafter 65 per cent of the deck crew, exclusive of licensed officers and apprentices, are of a rating not less than able seamen.

With regard to the first portion of these requirements, so far as the language test is concerned, a somewhat important question arises as to vessels carrying Chinese or Lascar crews. Is the Serang, or head man in charge of Asiatics, to be considered an "officer" for the purpose of this section of the act? If not, a very serious position is created for British vessels carrying this class of crew, a large number of which visit United States ports. Without some authoritative ruling on this point there is certain to be a disparity of practice at the various ports which will necessarily create a preference by foreign ship masters, who will avoid those ports where the collector of customs is not disposed to show a reasonable amount of laxity in his reading of the section.

No great exception can be taken to the second clause of this section in the main. The qualifications of an able seaman set forth therein are moderate, except in so far as the last proviso is concerned, viz., that no person will be considered to be an able seaman unless he has passed an examination as to eyesight, hearing and physical condition held under the rules prescribed by the department of commerce.

It seems a pity that the United States authorities, in framing this act, should not have had more consideration for the law and practice of foreign nations. It has never been the practice of the British board of trade to require an eyesight test as a qualification for seamen, and the operation of this section practically means that all British seamen must in future be made to obtain a certificate not only for sight and hearing but for general physical condition. This is not the place to discuss the respective merits of the American and the British practices in this respect. That the British practice of insisting only upon officers passing a test in eyesight is open to criticism goes without saying. But the point at issue is whether it is prudent on the part of any one nation to impose upon the remainder of the maritime interests of the world the obligation of amending their regulations with respect to the qualification of the personnel of their vessels, for that is what the effect of the said law will really amount to in such an important degree.

Discipline

By section 16 the punishment by imprisonment for desertion of seamen from a foreign ship in a United States port will no longer be operative after the necessary period required in the notice to the foreign countries concerned.

Desertion from British ships in United States ports has been for a long time a serious question for ship owners on this side. Such desertions have been frequent in the past and have occasioned considerable inconvenience and expense. It is much to be regretted, therefore, that the United States authorities are no longer willing to punish such desertions by imprisonment—probably the most effective deterrent—and the result of the change will doubtless be to increase the number of desertions.

It is too early to predict with any degree of certainty the full effect of the seamen's act on the shipping of foreign nations, as only experience of its operation will disclose the measure of its influence. On the whole it may be taken as adversely prejudicial to the interests of British ship owners and is certainly not calculated to promote harmonious relations between the mercantile interests of Great Britain and the "powers that be" in the United States.

Tender for Lake Liners

The growth of Great Lakes passenger and summer resort traffic has developed an interesting type of auxiliary or tender for the large lake liners. These craft, generally gasoline-powered, are used to transfer passengers and baggage between steamship piers and various hotel docks. The accompanying illustration shows a typical gasoline ferry-tender, OTTAWA, operated by the Grand Rapids, Holland & Chicago electric railway in connection with the Graham & Morton Transportation Co. OTTAWA plies between a pier in Macatawa bay,



GASOLINE FERRY OPERATED ON
MACATAWA BAY, MICH.

Mich., and various hotel landing-stages. In addition to her regular traffic, she is also employed in general ferriage. She is 65 feet long with 17½-foot beam, has a carrying capacity of 170 passengers and a speed of nine miles an hour.

July Lake Levels

The United States lake survey reports the stages of the Great Lakes for the month of July, 1916, as follows:

Lakes.	Ft. above mean sea level.
Superior	603.65
Michigan-Huron	581.16
Erie	573.24
Ontario	247.93

Lake Superior is 0.17 foot higher than last month, 1.40 feet higher than a year ago, 1.25 feet above the average stage of July of the last ten years, 0.17 foot below the high stage of July, 1876, and 2.17 feet above the low stage of July, 1879. During the last ten years the July level has averaged 0.2 foot higher than the June level and 0.2 foot lower than the August level.

Lakes Michigan-Huron are 0.22 foot higher than last month, 1.26 feet higher than a year ago, 0.29 foot above the average stage of July of the last ten years, 2.42 feet below the high stage of July, 1876, and 1.26 feet above the low stage of July, 1896. During the last ten years the July level has averaged about the same as the June level and

about the same as the August level.

Lake Erie is 0.02 foot lower than last month, 1.20 feet higher than a year ago, 0.50 foot above the average stage of July of the last ten years, 1.17 feet below the high stage of July, 1876, and 1.78 feet above the low stage of July, 1895. During the last 10 years the July level has averaged 0.1 foot lower than the June level and 0.1 foot higher than the August level.

Lake Ontario is 0.07 foot higher than last month, 2.80 feet higher than a year ago, 1.16 feet above the average stage of July of the last 10 years, 0.79 foot below the high stage of July, 1862, and 3.34 feet above the low stage of July, the June level and 0.3 foot higher than the August level.

Cargo Handling

(Concluded from page 304)

used at some of the Atlantic coast terminals. Traveling and stationary cranes and the ship's winch are used for the secondary movement of loading.

The author believes that on the ship should be at least two double winches for each hatchway, and sufficient booms for burtoning the load, simultaneously, either upon the shore or lighters.

The quay or piers should be equipped with traveling gantry jib cranes, one for each 100 feet of lineal frontage, spanning two or three railway tracks between the shed and the quay wall.

Within the shed there should be overhead movable cross tracks connecting with fixed side tracks, so as to assort and distribute the freight and to serve every cubic foot of space by a continuous succession of movements, without rehandling or using floor space; and, also, so as to afford a short path across the shed from the vessel on one side of the pier to another vessel on the other side. The freight should be moved without congestion or delay, by burtoning between the hooks of the gantry cranes or of the ship's winches and the hooks of the traveling hoists.

Freight should be transferred between the shed and any floor of a warehouse by one direct movement of the gantry cranes. In order to secure the greatest rapidity and economy in freight movements, the design of ships and the plan and layout of the elements of terminals should receive careful co-operative study.

For bulk material, the mechanism should be able to reclaim as well as store, and to distribute at a considerable distance from the quay walls.

American Ship Yard Activities

A Snappy Summary of the Leading Events of the Month in the
Vessel Construction Field

Emory L. Ford Launched at Lorain

EMORY L. FORD, the third typical Great Lakes freighter of the 12,000-ton class built at the Lorain, O., yards of the American Ship Building Co. during the present season, was launched successfully July 15. A fourth freighter of this type is building at Lorain and will be launched before the close of the year. This activity contrasts strongly with that of 1915, when only a single carrier of this class was constructed. The new boat is 600 feet over all, and has a keel 580 feet long. The beam of the vessel is 60 feet and the molded depth 32 feet. The big freighter was designed to carry a cargo of 12,000 tons, but at the present stage of the water in the lakes, her cargo carrying capacity will easily reach 13,000 tons. The ship will be loaded

through 36 hatches. Three Scotch boilers will provide steam for the triple expansion engine. The boilers are 13½ feet in diameter and are 11 feet long. The cylinders of the engine are 24½ x 41 x 65 inches in diameter; the stroke is 42 inches. EMORY L. FORD, in addition to the customary rooms for the officers and crew, has two rooms provided for the use of passengers.

The new freighter was christened by Miss Elizabeth Miller, of Detroit, who successfully broke a bottle of wine over the bow of the ship as she slid easily down the ways into the water. The sponsor and party came from Detroit on the steam yacht GALATEA with E. L. Ford for whom the ship was named. The launching was also attended by a number of Cleveland and Pittsburgh

people including H. K. Oakes, Cleveland, manager of the Franklin Steamship Co., which will operate the boat. After the launching, the party came by special car and by motors to Cleveland where a luncheon was served at the Union Club. On the way to Cleveland a gold watch was given to Captain Sullivan by the sponsor, Miss Miller, in behalf of the Franklin Steamship Co. for his faithfulness during his 10 years of service with the company. After the luncheon, the launching party went to the Cleveland Country Club, the Detroit guests returning that evening on GALATEA which awaited them at the club.

An unusual incident which attracted attention to E. L. FORD during construction, was the choice of the freighter as



EMORY L. FORD LEAVING THE WAYS. INSERT SHOWS SPONSOR AND LAUNCHING PARTY

a home by two families of robins who built their nests on the arches over the cargo space, in plain sight. Seemingly they were not bothered by the din of hammers and riveting machines on all sides. The young robins were hatched a few weeks previous to the launching of the ship.

Three Ore Boats Ordered

Three additional bulk cargo vessels of large tonnage, especially designed for carrying iron ore from Chile and Cuba, have been ordered from the Sparrows Point, Md., yard by the Bethlehem Steel Co. These vessels will be 523 feet long, 66 feet beam and will have a cargo capacity of 17,000 tons each. They will carry ore from Cruz Grande on the Pacific coast of Chile to New York and will return in ballast. The round-trip, about 9,000 miles, is expected to be made in 50 days. Two smaller vessels also have been recently ordered from the Sparrows Point yard by the Bethlehem Steel Co. for transporting ore from Cuba. These ships will be 470 feet long, 57 feet beam and will have a cargo capacity of 11,300 tons. They will deliver ore either to Baltimore or New York and will return in ballast. The round trip, 2,500 miles, is expected to be made in two weeks.

Both types of vessels will be equipped with a single screw and will be driven by steam turbines of the Curtis type, equipped with reducing gear. They will fly the American flag and will be operated by the Ore Steamship Corporation, a new subsidiary of the Bethlehem Steel Co. The names of the three larger boats will be BETHORE, CUBORE and FELTORE.

The Bethlehem Steel Co., owning its own ore properties and operating its own vessels, will be independent of the fluctuations of steamship rates to a large extent, and will be fully protected on the largely-increased quantities of ore required for operating its enlarged plants.

The Bethlehem Steel Co., it has been recently announced officially, plans to expend \$3,000,000 in enlarging the ship yard at Sparrows Point, Md., formerly operated by the Maryland Steel Co., which concern has been absorbed.

Will Build Standard Ships

Standardized ships will be built at Chepstow, River Wye, England, by a newly organized company. A capital of about \$1,500,000 has been privately subscribed, the shareholders including the following leading shipping companies: P. & O. and British India, New Zealand Shipping, Orient Steam Navigation, Federal Steam Navigation, Furness, Withy & Co., Shire Line, A. Weir & Co., Harris & Dixon,

Ltd., Trinder, Anderson & Co., Bethell Gwyn & Co. and Birt, Potter & Hughes, Ltd. No public issue of capital is contemplated.

The chairman is James Caird, head of Turnbull, Martin & Co., ship owners, and a director of shipping and allied companies. The vice chairman is John H. Silley, managing director of R. & H. Green and Silley Weir, Ltd., one of the oldest ship building and ship repairing companies in England. The other directors are: Frank E. Dixon, director of Harris & Dixon, Ltd.; John Esplen, director of William Esplen, Son & Swainston, Ltd.; John B. Gray, of Gray, Dawes & Co.; Richard H. Green, chairman of R. & H. Green and Silley Weir, Ltd.; Allan Hughes, chairman of the Federal Steam Navigation Co., and director of the New Zealand Shipping Co., Ltd.; F. W. Lewis, deputy chairman of Furness, Withy & Co., Ltd.; Andrew

Weir, head of Andrew Weir & Co.

A site of from 40 to 45 acres has been secured on the River Wye, two miles from the Bristol Channel, giving a depth of water for launching of 45 feet, and has been plotted out.

The plans which have been prepared provide for the construction of nine or ten large ships at the same time. Ships of a standard type of about 8,500 tons deadweight will probably be built at first, but it will be possible to build vessels up to 12,000 tons. The length provided for is from 450 feet to 650 feet. The type of vessel would be such as would in normal times load outward cargoes of coal and bring home wheat and other essential commodities. She would be able to go practically anywhere and everywhere. The machinery at Chepstow will be especially designed for producing standardized parts of hulls and engines.

Seattle Concern Purchased

CONTROL of the Seattle Construction & Dry Dock Co., Seattle, Wash., was taken over by the Todd Shipyards Corporation, New York, July 25, and the new company proceeded at once with the reorganization and plans for enlarging of the Seattle plant. J. V. Patterson, general manager since the yard was purchased from Moran Bros. Co. in 1905 and became the Moran Co., and later the Seattle Construction & Dry Dock Co., resigned and his place was taken by Clarence W. Wiley.

William H. Todd, of New York, is president of the new company; C. W. Wiley, vice president and general manager, and Harry W. Kent, secretary and treasurer. The other members of the board of directors are H. F. Alexander, president of the Pacific Alaska Navigation Co.; W. H. Bogle and F. T. Merritt of the firm of Bogle, Graves, Merritt & Bogle, attorneys; E. C. Ward, vice president of the Pacific Coast S. S. Co., all of Seattle, and R. F. Walcott, of New York City.

The Todd Shipyards Corporation, into whose ownership the Seattle yard has passed, also controls the Robins Dry Dock & Repair Co., Erie Basin, Brooklyn, and the Tietjen & Lang Dry Dock Co., Hoboken, N. J. The property represented in this merger of ship building and repair concerns aggregates in value \$16,000,000.

The Seattle yard will be enlarged and improved as fast as conditions warrant. A new floating dry dock will be built at once to take care of the larger shipping that is coming into Seattle harbor. Two new building ways are under construction and more will be built if needed. The yard has all of the new

work and repair work it can handle at present and more is in sight.

President Todd has come up to his present position from the ranks beginning his ship building career as riveter boy with the Pusey & Jones ship-building plant at Wilmington, Del. Afterward he became master ship builder in the Brooklyn navy yard and about 20 years ago went with the Robins Dry Dock & Repair Co., of which plant he afterwards became superintendent and then president.

Clarence W. Wiley came to the Pacific coast from Boston about 1900 as marine superintendent of the Boston Steamship Co. and the Boston Towboat Co. He was a graduate of the Massachusetts Institute of Technology and had been in the office of these companies in Boston. At that time the Boston Steamship Co. was operating the steamships SHAWMUT and TREMONT, which were afterwards sold to the Isthmian Canal Commission for the run between New York and the Panama canal. They also operated LYRA, HYADES and PLEIADES in their business between Seattle and the Orient.

In 1908 he helped to organize the Crosby Towboat Co., and among his other duties served as its president for a number of years. In 1908 he severed his connections with the Boston Steamship Co., but continued to act as agent for the Crosby Towboat Co. until 1911.

Continuing his success in the steamship line, Mr. Wiley became manager of the Alaska Pacific Steamship Co. in 1913 and was with that company until he went to the Great Northern Pacific Co. as marine superintendent, with offices in San Francisco, early in 1915.

New Company Buys Pacific Yard

The Hall Brothers Marine Railway & Ship Building Co., Winslow, Wash., has been purchased by the newly organized Winslow Marine Railway & Ship Building Co. The sale is of particular interest at this time as the new company has plans for extensions that will make it a larger factor in new construction work on the western coast.

The Hall Brothers yard is one of the oldest on the Pacific coast and has a world-wide reputation, particularly for the construction of wooden vessels. Lately it has been carrying on a very large repair business.

The new Winslow company is headed by James Griffiths, president. Mr. Grif-

provided for the vessels concerned. These incidents took place in Baltimore, Boston, Buffalo, Chicago, Cleveland, Detroit, Indianapolis, Duluth, Louisville, Rochester and Providence.

Wire Drag Discloses Dangers

Wire-drag work in the approaches to Salem Harbor, Mass., which was begun by a party sent out by the United States coast and geodetic survey in May of this year, has resulted in discovering a number of uncharted and previously unknown pinnacle rocks and shoal spots with depths less than charted, some of which constitute serious dangers to navigation. The most important of these are a 20-foot rock in the main

Few Life Buoys Required

The United States steamboat inspection service has issued a circular letter, quoting an act of congress approved June 12, which reduces the number of life buoys required to be carried on certain vessels under the provisions of section 14 of the seamen's act. The act of June 12 fixes the minimum number of life buoys with which vessels are to be provided, as follows: Vessels under 100 feet in length, minimum number of buoys, two; vessels 100 feet and less than 200 feet in length, minimum number of buoys, four, of which two shall be luminous; vessels 200 feet and less than 300 feet in length, minimum number of buoys, six, of which two shall be luminous; vessels 300 feet and less than 400



SHIP BUILDING AND REPAIR YARD OF THE WINSLOW MARINE RAILWAY & SHIP BUILDING CO.

fiths for many years has been a prominent factor in developing the marine trade along the western coast. Stanley A. Griffiths is secretary and treasurer. John L. Hubbard, formerly general manager of the Hall yard, will continue as general manager of the new company. C. C. Lacey, formerly marine superintendent of the Great Northern Railway Co., has been made assistant general manager.

It is expected that construction work on two large schooners will be started shortly at Winslow. The new company plans to give particular attention to the development of diesel-engined auxiliary lumber schooners.

The bureau of navigation, department of commerce, reports that during the first week in July in the case of 65 vessels involving 66,900 passengers the navigation inspectors stopped the embarkation of an excessive number of passengers over and above the lawful limit

ship channel, where 7 fathoms were charted southward from Johns Ledge, and a 24-foot shoal east of Newcombs Ledge, where 7½ fathoms were charted.

As it was announced that the navy department intended sending the battleship VERMONT to Salem on July 4, the results of the wire-drag were furnished by the survey to the navy department, the dangers discovered were buoyed and a safe anchorage marked. The dangers discovered decrease the available width of the main ship channel considerably. The examination is not reported as completed, and additional information will be furnished as soon as received.

The importance of the complete development of the channel was shown on July 1, when the steamer GULF STREAM of the Gulf Refining Co. went through the channel, drawing 24 feet, very close to a 23-foot shoal north of Bowditch Ledge, barely escaping what might have been a serious accident.

feet in length, minimum number of buoys, 12, of which four shall be luminous; vessels 400 feet and less than 600 feet in length, minimum number of buoys, 18, of which nine shall be luminous; vessels 600 feet and less than 800 feet in length, minimum number of buoys, 24, of which 12 shall be luminous; vessels 800 feet and over in length, minimum number of buoys, 30, of which 15 shall be luminous.

All the buoys shall be fitted with beackets securely seized. Where two buoys only are carried, one shall be fitted with a life line at least 15 fathoms in length, and where more than two buoys are carried, at least one buoy on each side shall be fitted with a life line of at least 15 fathoms in length. The lights shall be efficient self-igniting lights which can not be extinguished in water, and they shall be kept near the buoys to which they belong, with the necessary means of attachment.

U. S. Ship Yards Regain First Rank

American Ship Builders Turning Out More Ships Than Those
of Any Other Nation—Our Ocean Tonnage Gaining Rapidly

THE LATENT ability of the American business men to surmount difficulties is generally recognized. In the early days of the republic American ship yards hoisted this country to practically the top rank of maritime nations by building better and speedier ships than the yards of any other nation. Since the decadence of our merchant marine, subsequent to the civil war, this business ability has been diverted largely to the railroad, iron and steel, coal, lumber and other industries.

Official reports made public within the last few days seem to indicate that the pendulum is swinging back, and that America's business-developing ability is once more boosting our merchant marine to its proper rank.

The bureau of navigation of the department of com-

At present the United States for the first time in over half a century is not only building more merchant shipping than any other country, but the American output for the year 1916 will probably exceed that of all the rest of the world. The most complete records of the world's ship building, uniform for a period of years, are those published by *Lloyd's Register* showing merchant vessels over 100 gross tons launched each calendar year, not including vessels built for rivers, barges, and other unrigged craft. For

this reason Lloyds figures are somewhat less than the government returns for the United States, the Netherlands, Germany, and other countries, with considerable river and canal navigation. Lloyds returns for the calendar years 1912, 1913, 1914 and 1915, as shown in Table I, are the best measure of the effect of the European war on merchant ship building, although changes in the case of the United States are not attributable to that cause. The world's output of merchant shipping during the calendar year 1913 was the largest recorded, and under normal conditions probably would not have been fully maintained for two or three years following. The returns below for 1914 closed with the end of July so far as

Germany and Austria are concerned, as those countries have issued no shipping reports since the outbreak of the war. Table I gives the gross tonnage of merchant vessels of 100 gross tons

merce in one of several encouraging reports, states that American yards for the first time in half a century are building more ships than those of any other nation and furthermore that the 1916 output of new ships in America may exceed the combined production of the rest of the world.

Also we learn that American tonnage in the foreign trade increased more than 300 per cent, comparing 1916 with 1914. In value of exports carried in the 11 months ending in May, 1916, American ships registered a gain of 65 per cent over the corresponding period of the preceding year.

The following article groups in convenient form the reports recently issued by the bureau and reveals with exhaustive clarity the story of how private capital has rallied to the war emergency.

and was above the recent average annual output.

The belligerent powers, which in 1913 launched 2,798,580 gross tons of merchant ships, launched only 769,875

gross tons in 1915.

The neutral powers, outside of the United States, in 1913 launched 257,844 gross tons, and in 1915 launched 254,303 gross tons. Local causes led to a further reduction in the American output from 276,448 tons in 1913 to 177,460 tons in 1915. The total decline in the world's ship building for 1914 and 1915, both compared with 1913,

was 1,438 ships of 2,611,373 gross tons. To these totals should now be added the decreased output in ship yards for the first six months of 1916, which the bureau of navigation states would bring the total since the outbreak of the war in August, 1914, up to 3,500,000 gross tons, notwithstanding the present activity of American, Japanese and Dutch yards. The loss to international commerce through the decline in ship building thus has been greater than the loss through the actual destruction of shipping, although the latter has fixed the world's attention because of the submarine attacks on passenger steamships. Reports recently compiled show that 1,346 ships of 2,713,996 gross

Table I.
Vessels Launched in the World 1912-1915

	1912.		1913.		1914.		1915.	
Where built.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
United Kingdom	712	1,738,514	688	1,932,153	656	1,683,553	327	650,919
British Colonies	84	34,790	91	48,339	80	47,534	31	22,014
Austria-Hungary	12	38,821	17	61,757	11	34,335	2	2
Denmark	22	26,103	31	40,932	25	32,815	23	45,198
France	80	110,734	89	176,095	33	114,052	6	25,402
Germany	165	375,317	162	465,226	89	387,192	2	2
Italy	27	25,196	38	50,356	47	42,981	30	22,132
Japan	168	57,755	152	64,664	32	85,861	26	49,408
Netherlands	112	99,439	95	104,296	130	118,153	120	113,075
Norway	89	50,255	74	50,637	61	54,204	59	62,070
Sweden	22	13,968	25	18,524	26	15,163	27	20,319
United States:								
Coast	144	194,273	182	228,232	84	162,937	76	157,167
Great Lakes	30	89,950	23	48,216	10	37,825	8	20,293
Oth. countries	52	46,654	83	43,455	35	36,148	10	13,641
Total	1,719	2,901,769	1,750	3,332,882	1,319	2,852,753	743	1,201,638

¹Returns not complete. ²Returns not available.

or over launched in the world during the calendar years 1912 to 1915, inclusive.

Effect of War on Ship Building

The first five months of the war did not seriously affect the world's launching of merchant ships, outside of Belgium, France and Germany, although deliveries late in 1914 began to be slow in British yards. In 1914 the United States launched only 200,762 gross tons, compared with 276,448 gross tons in 1913, but the decrease was not a result of the war. The world's total in 1914, even with the Central Powers excluded for five months, was only 480,000 tons less than the world's maximum in 1913,

tons were destroyed from the outbreak of the war to June 30, 1916.

Late in 1915 and early in 1916 belief that the European war would last three years led to an exceptional development of ship building by the maritime powers not actively engaged in war. In the first six months of 1916 the United States launched and put into operation 192 ships of 228,016 gross tons (each over 100 tons)—more than the entire year's output for 1914 or 1915. On July 1, 1916, private American ship yards were building or had on order 385 steel merchant ships of 1,225,784 gross tons. The builders' returns indicate that of this tonnage 159 ships of 444,090 gross tons will be launched before Dec. 31, 1916, thus indicating a total output by the United States for the 12 months of 351 steel ships of 672,106 gross tons. Various causes retard ship building, especially in times of high pressure, and the output of steel ship tonnage during the current six months of 1916 may fall short of present indications. Wooden ships, however, not included in the bureau of navigation's monthly returns, will help to make good any shortage, as wooden-ship building has revived considerably under the present insistent demand for tonnage.

The ship yards of Japan, according to Commercial Attache Arnold's recent report, are fully occupied with work for two years and have reluctantly been obliged to decline foreign orders in order to supply their own

according to recent reports of American officers, have contracted to build merchant ships at extraordinary prices practically up to their capacity for 1916, 1917 and into 1918. Ships thus building or ordered late in 1915 were reported at 71, of 251,750 gross tons. Delivery, however, seems to be somewhat slow, as during the first three months of 1916 only seven new ships,

80,561 gross tons.

French ship yards also are fully employed on naval construction and the manufacture of munitions, and French ship owners have made inquiries for tonnage from American builders. There is in France a considerable tonnage of merchant steamships partly built.

In December, 1915, the Italian ship

Table III.
American Trade With Europe

Destination.	American.		Foreign.		Total.	
	1914.	1916.	1914.	1916.	1914.	1916.
	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.
Austria-Hungary			517,963		517,963	
Belgium	187,965		943,769		1,131,734	
France		184,140	1,763,808	3,452,567	1,763,808	3,636,707
Germany	8,406		3,893,667		3,902,073	
Gt. Britain & Ireland	241,606	604,604	7,351,796	7,700,103	7,593,402	8,304,707
Greece		5,727	93,203	345,855	93,203	351,582
Italy		135,116	1,893,915	3,444,597	1,893,915	3,579,713
Netherlands	8,926	10,014	1,751,756	1,356,129	1,760,682	1,366,143
Russia in Europe		23,535	157,434	197,906	157,434	221,441
Scandinavia		114,593	681,393	1,482,153	681,393	1,596,746
Spain		11,464	422,571	547,177	422,571	558,641
Other Europe		764	45,759	265,226	128,013	310,985
Total	447,667	1,134,952	19,598,524	18,791,713	20,046,191	19,926,665

of 15,349 gross tons, were added to the Dutch seagoing merchant fleet, while in the same period TUBANTIA, 13,900 tons, PALEMBANG, 6,673 tons, and others were sunk by submarines and drifting mines.

Norway's output of 85,000 tons in 1915 was the largest recorded and will doubtless be exceeded this year, as over a year ago Norwegians began to place large orders in American

yards had 12 steel steamships, of 82,482 gross tons, under construction, but the probable date of completion is not known. There are no returns from Austria-Hungary, and presumably ship building has ceased under the Italian blockade of Trieste and Fiume.

Since the outbreak of the war Germany has printed no returns, and is supposed to be engaged in building submarines and on other naval construction, repair and munitions work. In December, 1913, the Germanischer Lloyd report showed 499 merchant vessels of 906,851 gross tons, including river boats, canal boats, lighters, etc., were building in German yards, of which up to July 30, 1914, 89, of 387,192 gross tons, had been launched, so that in August, 1914, about 410 vessels, of 520,000 gross tons, were building or ordered in German yards. Cabled statements to the United States in July, 1916, from Hamburg-American and North German Lloyd authorities indicate that such merchant work as Germany has done since the outbreak of the war has been, with few exceptions, on the ships ordered late in 1913 and early in 1914.

The merchant shipping, American and foreign, amounting to 25,475,103 net tons, which cleared from seaports of the United States for Europe, South America, Asia, Africa, Australia and Oceania during the fiscal year ended June 30, 1916, was the largest in the history of the United States notwithstanding the European war, the capture of the port of Antwerp, and the closing of the Black sea, the blockade of the ports

Table II.
Clearances from American Ports

Clearances for—	American.		Foreign.		Total.	
	1914.	1916.	1914.	1916.	1914.	1916.
	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.
Europe	447,667	1,134,952	19,598,524	18,791,713	20,046,191	19,926,665
South America	192,479	945,353	2,237,171	1,764,720	2,429,650	2,710,073
Asia	72,218	131,198	1,165,083	1,489,196	1,237,301	1,620,396
Australia, etc.	28,615	157,390	724,189	596,486	752,804	753,876
Africa	4,263	79,412	402,194	384,681	406,457	464,093
Total	745,242	2,448,305	24,127,161	23,026,796	24,872,403	25,475,103

ship owners. The ships building for delivery this year number 50 of 189,450 gross tons, which will be more than double Japan's largest output, in 1914. Japanese builders have contracts for 104 ships of 464,370 gross tons to be delivered in 1916, 1917 and 1918, the Osaka yard contracting to deliver 35 of 162,400 tons. Japan, however, is obliged to import steel and began negotiations in the United States in January, which have been carried out successfully and extended considerably the market for American steel products.

The ship yards of the Netherlands,

yards, some with a view to subsequent sale to Americans or others.

On March 31, 1916, the ship yards of the United Kingdom had under actual construction, according to *Lloyds Register*, 423 steel steamships, of 1,423,335 gross tons, many of which for some months have been nearly completed, but await materials. The dates of launch and completion in British yards are uncertain so long as yards are employed on naval construction and turning out war munitions for the allies. During the first three months of 1916 British yards launched only 69 steel steamers, of

of the Central Powers, the withdrawal of German and Austrian merchant ships from the trade, and the dangers from submarines and mines cast adrift in the routes of ocean commerce.

net tonnage in 1914 was a trifle larger—half of 1 per cent—much of the net tonnage in 1914 was for the passenger trade, as stated, which in 1916 was relatively small, and cargo space in

Powers. The total tonnage clearances to France and Italy almost doubled, the clearances to Norway, Denmark and Sweden more than doubled, and to Greece increased over threefold. Table III summarizes the net tonnage clearances to European countries.

American shipping in trade with South America has developed more rapidly in the past fiscal year than in any other direction. The American tonnage cleared was almost five times greater than in 1914, and in trade with Argentina particularly the increase is notable. The withdrawal of foreign ships has been made good by increased American tonnage. The increase in total clearances in partly due, of course, to improved financial conditions in those countries, except Peru, and to the removal of the risk of destruction which checked trade with South America for some months after the outbreak of the war. The clearances for South America are shown in Table IV.

The clearances from the United States for Africa on both oceans and on the Mediterranean increased from 406,457 net tons in 1914, to 464,093 net tons in 1916. In 1914 the American shipping thus cleared was insignificant, only 4,263 net tons, while in the past year it mounted to 79,412 net tons, of which over half, in spite of submarine warfare in the Mediterranean, was cleared for Egypt and Algiers. The foreign net tonnage clearances

Table IV.
Clearances for South America

Destination.	American.		Foreign.		Total.	
	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.
Argentina	4,757	191,436	611,360	575,842	616,117	767,278
Brazil	62,356	259,619	648,345	548,880	710,701	808,499
Chile	44,385	236,578	482,377	355,547	526,762	592,125
Colombia	285	109,197	271,804	74,319	272,089	183,516
Peru	48,457	32,385	42,951	50,794	91,408	83,179
Uruguay	7,310	54,657	93,069	121,743	100,379	176,400
Venezuela	23,066	52,286	29,800	13,357	52,886	65,643
Other South America..	1,863	9,195	57,465	24,238	59,308	33,433
Total	192,479	945,353	2,237,171	1,764,720	2,429,650	2,710,073

Table V.
American Trade With the Orient

Destination:	American.		Foreign.		Total.	
	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.
Asia.						
China	4,952	37,452	348,147	162,624	353,099	200,076
British India		19,707	120,832	135,051	120,832	154,758
Hongkong		9,346	75,879	243,856	75,879	253,202
Japan	66,615	13,462	531,890	378,086	598,415	391,548
Other Asia	651	51,231	88,425	569,581	89,176	618,610
Total	72,218	131,198	1,165,083	1,489,196	1,237,301	1,620,396
Oceania.						
Australia	14,243	136,173	492,119	431,154	506,462	562,406
Philippine Islands	2,051	1,181	143,945	86,407	145,996	87,588
Other Oceania	12,321	20,036	88,125	78,725	100,346	95,682
Total	28,615	157,390	724,189	596,486	752,804	753,876

Up to this fiscal year the greatest volume of clearance from the United States for the overseas continents named was 24,872,403 net tons during the year ended June 30, 1914, just before the outbreak of the European war. Much of the net tonnage in that year was space for passengers (tourists and immigrants) on ocean steamers, while during the fiscal year just closed such fast steamers to a great extent have been withdrawn from trade to serve as allied transports and hospital ships or held in port to avoid capture, and their place has been supplied by cargo steamers. (A net ton is 100 cubic feet of ship's closed-in space available for cargo or passengers.)

American shipping cleared for the overseas continents during the year just closed was more than three times that of 1914, being 2,448,305 net tons, compared with 745,242 net tons for the fiscal year 1914. The American net tonnage cleared from the United States for these continents in the years ended June 30, 1914 and 1916, the foreign net tonnage so cleared, and the combined American and foreign tonnage are shown in Table II, American tonnage more than doubling in each case and foreign tonnage showing a decrease, except to Asia.

During the past fiscal year our shipping facilities (net tonnage) for the export trade to Europe, have been the greatest in our history. Although the

1916 was supplied to help to meet the great volume of our exports. During 1914 the American Line mail steamers to Southampton and the Red Star Line passenger ships to Antwerp

Table VI.
American Trade With Nearby Countries

Clearances for—	American.		Foreign.		Total.	
	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.	1914. Tonnage.	1916. Tonnage.
Nova Scotia and British Columbia	1,854,058	1,998,805	2,855,943	2,733,882	4,710,001	4,732,687
British West Indies and Bermuda	138,073	266,163	1,520,591	653,852	1,658,664	920,015
Cuba	871,506	1,810,358	1,738,337	1,257,095	2,609,843	3,067,453
Panama	500,009	1,139,889	838,097	84,518	1,338,106	1,224,407
Mexico, Haiti, and Dominican Republic....	964,553	1,691,412	2,203,413	787,837	3,167,966	2,479,249
Cent. America and W. Indies, except British	66,883	390,150	1,198,620	606,197	1,265,503	996,347
Total	4,395,082	7,296,777	10,355,001	6,123,381	14,750,083	13,420,158

Table VII.
America's Ship Building Record

Period.	Building or under contract.		New contracts.		Vessels completed.	
	No.	Gr. tons.	No.	Gr. tons.	No.	Gr. tons.
July 1, 1915.....	76	310,089	..	.....	..	.....
Feb. 1, 1916.....	230	901,371	20	61,136	6	31,329
Mar. 1, 1916.....	244	945,798	107	151,296	5	23,394
Apr. 1, 1916.....	360	1,067,856	20	51,011	6	12,915
May 1, 1916.....	368	1,129,014	20	81,470	13	53,840
June 1, 1916.....	372	1,147,534	39	114,530	10	39,940
July 1, 1916.....	385	1,225,784	..	.....	..	.....
Total .....	..	.....	206	459,443	40	161,418

were virtually the only American ships in trade with Europe; in 1916 American ships traded with most of the maritime nations of Europe, except Belgium and the blockaded Central

decreased from 402,194 in 1914 to 384,681 in 1916.

The total tonnage clearances from the United States of ships on trans-Pacific voyages to ports in Asia, Aus-

tralia, the Philippines and foreign islands of the Pacific increased from 1,990,105 net tons in the fiscal year of 1914 to 2,374,272 net tons in 1916, and of these amounts American net tonnage increased from 100,833 net tons in 1914 to 288,588 net tons in 1916. Table V shows that the gains have not been uniform, but there have been marked increases and decreases in shipping facilities between the United States and the countries and colonies comprised within the limits named. Clearances to "other Asia", show the greatest increase from 89,176 net tons in 1914 to 618,610 net tons in 1916. During the past year "other Asia" has meant mainly Vladivostok, and the tonnage increase shows shipping facilities provided for the export of locomotives, cars, rails, motor trucks and steel products generally to Russia through Siberia, Russian Black Sea ports being closed and Baltic ports, especially Riga, partly closed during the year. The effect of the withdrawal of the Pacific Mail ships to Hongkong is to be noted and clearances to the Philippines also show a marked decrease. The Philippine figures do not include government transports.

Shipping to Nearby Foreign Ports

The gain of 602,700 net tons in export clearances of shipping from the United States across the seas and into waters which are, to a greater or less extent, the zones of naval and submarine operations and of war risk has been offset, however, by decreased clearances to foreign seaports on or near the coasts of North America. In 1914 these amounted to 14,750,083 net tons; in 1916 to 13,420,158 net tons. The principal decreases have been in clearances to the British West Indies, preoccupied with war, 738,649 net tons, and to Mexico, Haiti and the Dominican republic, disturbed by internal dissensions, 688,717 net tons.

In North American waters the foreign clearances of American ships show a large gain, but proportionately not so great as in overseas trade, advancing from 4,395,082 net tons in 1914 to 7,296,777 net tons in 1916. While the figures are larger, they represent a much smaller number of ships and these of less tonnage than the figures for overseas trade, because the voyages in American waters are relatively short and the same ship clears often during the year. To Cuba, Panama and Central America the American tonnage more than doubled in the year, as shown in Table VI.

Out of 38,895,261 net tons of shipping cleared on ocean voyages to foreign ports during the fiscal year ended June 30, 1916, 9,745,082 net tons

were American, or 25 per cent; in the fiscal year 1914, out of 39,622,486 net tons only 5,141,324, or 13 per cent, were American. Including frequent but short fresh-water foreign trips to Canada across the Great Lakes and the St. Lawrence river, American tonnage in 1916 was 34 per cent of the total.

Progress of American Ship Building

Steel merchant vessels building or under contract to be built in private American ship yards at the beginning of the new fiscal year, July 1, 1916,

soon as practicable, and the remainder before July 1, 1919. For comparison, on June 30, 1914, British ship yards were building 90 war ships of 592,545 tons displacement, of which 76 of 458,175 tons displacement were building at private yards.

The unusual growth of steel merchant ship building in the United States during the past 12 months is shown by the summary shown on Table VII of (a) steel merchant ships building or under contract to be built in private American ship yards on

Table VIII.

Merchant Tonnage Building in U. S. Yards

Shipyards.	Merchant construction, July 1, 1916.		To be launched during fiscal year ending:			
	Num. ber.	Gross tons.	Num. ber.	Gross tons.	Num. ber.	Gross tons.
American Bridge Co., Ambridge, Pa., and Trenton, N. J.	105	49,394	105	49,394	.	.....
Amer. Ship Bldg. Co., Cleveland, O.	23	82,200	18	56,800	5	25,400
Baltimore Dry Docks & Ship Building Co., Baltimore, Md.	7	24,500	7	24,500	.	.....
Bath Iron Works, Bath, Me.	3	21,600	3	21,600	.	.....
Charles Barnes Co., Cincinnati, O.	2	375	2	375	.	.....
Chester Ship Bldg. Co., Chester, Pa.	11	53,600	11	53,600	.	.....
Clinton Ship Bldg. & Repair Co., Philadelphia, Pa.	1	560	1	560	.	.....
Cowies Shipyards Co., Buffalo, N. Y.	2	56	2	56	.	.....
Ellicott Mach. Corp., Baltimore, Md.	2	500	2	500	.	.....
Fore River Ship Bldg. Corp., Quincy, Mass.	12	276,400	9	254,944	3	21,456
George Lawley & Sons Corporation, Neponset, Mass.	1	75	1	75	.	.....
Great Lakes Engrg. Wks., Detroit, Mich.	15	58,940	11	43,830	4	15,110
Great Lakes Towing Co., Cleveland, O.	4	360	4	360	.	.....
Harlan & Hollingsworth Corporation, Wilmington, Del.	15	63,959	9	40,144	6	23,815
Howard Shipyards Co., Jeffersonville, Ind.	6	3,400	6	3,400	.	.....
James Rees & Sons Co., Pittsburgh, Pa.	1	300	1	300	.	.....
Manitowoc Ship Bldg. & Dry Dock Co., Manitowoc, Wis.	8	10,700	6	6,200	2	4,500
Maryland Steel Co., Sparrows Pt., Md.	10	58,705	8	47,546	2	11,159
Merrill-Stevens Co., Jacksonville, Fla.	4	2,500	4	2,500	.	.....
Moore & Scott Iron Works, Oakland, Cal.	5	18,000	2	10,000	3	8,000
Newport News Ship Bldg. & Dry Dock Co., Newport News, Va.	16	111,947	10	66,699	6	45,248
New York Ship Building Co., Camden, N. J.	24	121,538	18	79,835	6	41,703
Pusey & Jones Co., Wilmington, Del.	16	12,906	10	3,306	6	9,600
Seattle Constr. & Dry Dock Co., Seattle.	7	42,600	5	30,300	2	12,300
Skinner & Eddy Corp., Seattle, Wash.	6	35,720	6	35,720	.	.....
Spedden Ship Bldg. Co., Baltimore, Md.	3	730	3	730	.	.....
Standard Ship Bldg. Corp., New York.	6	28,800	4	19,200	2	9,600
Staten Island Ship Bldg. Co., Port Richmond, N. Y.	5	5,241	5	5,241	.	.....
Tampa Fdy. & Mach. Co., Tampa, Fla.	1	2,000	1	2,000	.	.....
Tank-Ship Bldg. Corp., Newburgh, N. Y.	3	1,500	3	1,500	.	.....
Texas Steamship Co., Bath, Me.	4	26,000	2	12,600	2	13,400
Toledo Ship Building Co., Toledo, O.	9	22,620	6	17,220	3	5,400
Union Iron Works Co., San Francisco.	31	201,158	25	149,958	6	51,200
Willamette Iron & Steel Works & Northwest Steel Co., Portland, Ore.	5	28,500	5	28,500	.	.....
Wm. Cramp & Sons Ship & Eng. Bldg. Co., Philadelphia, Pa.	12	78,400	12	78,400	.	.....
Total	385	2,125,784	327	2,927,893	58	297,891

¹Detailed statement of new contracts not received. ²Incomplete.

according to builders' returns to the bureau of navigation, department of commerce, numbered 385, of 1,225,784 gross tons. It is interesting to recall that the new naval appropriation bill provides the largest naval building program in our history. The new battleships, battle cruisers, scout cruisers, and other types of warships and auxiliaries number 157 of approximately 855,000 tons displacement, to be built at an estimated cost of \$588,000,000. Of these 66 of about 382,000 tons displacement are to be begun as

July 1, 1915, and on July 1, 1916, and on the first day of the past five months, (b) new contracts for steel merchant ships entered into during the past five months, and (c) steel merchant ships built in the United States and officially numbered during those months.

For comparison, on March 31, 1916, private ship yards in the United Kingdom had under actual construction 423 steel merchant ships of 1,423,335 gross tons. As British ship yards are almost wholly engaged in naval construction

Table IX.

Ships Completed in 1916

Details of steel ships completed during the month of June, 1916, by the builders named, all of which are steamers, except MOONLITE and STARLITE, schooner-rigged, with auxiliary gasoline engines, are given below:

Vessels.	Gross tonnage.	Speed, knots.	Owner.	Type.	Trade.
Amer. Ship Bldg. Co.: D. G. Kerr.....	7,756	10	Pittsburgh Steamship Co.	Cargo	Coasting
Ellicott Mach. Corp.: P. R. R. No. 6....	191	11	Pennsylvania R. R. Co...	Towing	Coasting.
Fore River Ship Bldg. Corp.: Sucrosa.....	5,788	10½	Cuba Distilling Co.....	Molasses	Foreign
Great Lakes Engineering Works, Maitland	2,757	13	Toronto, Hamilton & Buffalo Ry. Co.....	Car ferry	Foreign
Harlan & Hollingsworth Corp., Geo. E. Paddleford.....	4,787	11	Pan American Petroleum & Transport Co.....	Bulk oil	Foreign
Manitowoc Ship Bldg. & Dry Dock Co.: Geo. A. Wallace....	112	9	City of Cleveland, O....	Fire boat	.....
New York Ship Bldg. Co.: Stand'd Arrow	7,794	11	Stand. Transp. Co.....	Bulk oil	Foreign
Toledo Ship Bldg. Co.: Moonlite.....	1,930	7	Stand. Oil Co. of N. J..	Bulk oil	Foreign
Starlite.....	1,930	7	Stand. Oil Co. of N. J..	Bulk oil	Foreign
Union Iron Wks. Co.: Acme.....	6,895	11	Stand. Trans. Co.....	Bulk oil	Foreign

and the manufacture of war munitions for the allies, merchant ship construction is slow, and during the first three months of 1916 only 67 steel steamers of 80,161 gross tons were launched. For further comparison, the entire world during the calendar year 1915, according to Lloyds Register, launched 743 merchant ships of 1,201,638 gross tons, of which 84 of 177,460 gross tons were launched in the United States.

Table VIII shows the first distribution of steel merchant ship building among the private ship yards of the United States and separately, the number and gross tonnage of the ships building or under contract which the builders expect to launch during the current fiscal year, ending June 30, 1917, and those which will not be launched before the fiscal year ending June 30, 1918. The table shows also details of the ships completed in June. The dates for launching are subject to the usual allowances for delays due to the several causes which affect steel industries. The urgency of the naval construction program may also prove a factor in the situation. Barring delay builders expect to launch 327 steel ships of 927,893 gross tons during the current fiscal year and 58 ships of 297,891 gross tons during the following fiscal year.

Evidence that the American flag is again becoming a familiar sight in foreign overseas ports is offered in statistics covering the arrival of American vessels during the period from Jan. 1 to May 30 last, and in the case of New York and Philadelphia to June 30, recently published by the department of commerce. The figures show that during that time 196 steamers of American registry, having a net tonnage of 597,363, entered ports

which ship sailed are shown in the following table:

Entries from:	Number of American steamers.	Net tonnage.
Europe	81	257,671
Africa	7	15,040
Asia	11	28,903
Oceania	6	17,262
South America	91	278,557
Total	196	597,363

The detailed record shows that more American ships were in the carrying trade from Chile than from any other country, attributable to the large nitrate requirements of this country. Forty-two ships having an aggregate net tonnage of 134,831 entered American ports from Chile, all but 14 coming to Atlantic coast ports. Other countries contributed to the South American total as follows: Brazil, 21 ships of 69,516 net tons; Argentina, 14 ships of 42,142 net tons; Colombia, six ships of 15,285 net tons, and other ports, eight ships of 32,008 net tons.

While nine American ships of less than 1,000 net tons were employed in the trade from South America, American ships arriving from Europe

Table X.
New Contracts in June, 1916

This table shows the details of new contracts for building steel ships entered into during June, 1916, so far as reported by ship builders.

Vessels.	Gross tonnage.	Speed, knots.	Owner.	Trade.	Probable date of launch.
Great Lakes Towing Co.: No. 41	90	9	Builder's account	Towing	
No. 42	90	9	Builder's account	Towing	
Manitowoc Ship Bldg. & Dry Dock Co.: No. 84	300	10	F. M. Dyer.....	Trawler	Oct. 1, 1916
No. 80	2,500	9	Berghansen	Cargo	
No. 81	2,500	9	Berghansen	Cargo	
No. 82	2,250	..	Hannevig & Johnson..	Cargo	
No. 83	2,250	..	Hannevig & Johnson..	Cargo	
Merrill-Stevens Co.: No. 92	300	7	Boston Molasses Co..	Molasses	January '17
Moore & Scott Iron Works: —	1,000	..	Wilson Bros. ....	.....
—	1,000	..	Wilson Bros. ....	.....
Pusey & Jones Co.: No. 1336	300	..	Christoffer Hannevig..	Cargo	
No. 1336	300	..	Christoffer Hannevig..	Cargo	
No. 1336	300	..	Christoffer Hannevig..	Cargo	
No. 1336	300	..	Christoffer Hannevig..	Cargo	
No. 1337	1,600	..	Christoffer Hannevig..	Cargo	
No. 1337	1,600	..	Christoffer Hannevig..	Cargo	
No. 1338	1,600	..	Christoffer Hannevig..	Cargo	
No. 1338	1,600	..	Christoffer Hannevig..	Cargo	
No. 1339	1,600	..	Christoffer Hannevig..	Cargo	
No. 1339	1,600	..	Christoffer Hannevig..	Cargo	
Standard Ship Bldg. Corporation: No. 4	4,800	10½	Builder's account.....	Cargo	
No. 5	4,800	10½	Builder's account.....	Cargo	
No. 6	4,800	10½	Builder's account.....	Cargo	
Texas Steamship Co.: No. 1	6,300	11	Builder's account.....	Bulk oil	March, '17
No. 2	6,300	11	Builder's account.....	Bulk oil	May, 1917
No. 3	6,700	11	Builder's account.....	Bulk oil	October, '17
No. 4	6,700	11	Builder's account.....	Bulk oil	Dec., 1917
Union Iron Wks. Co.: No. 148	7,200	11	Not given	Bulk oil	June 1, '17
No. 149	7,200	11	Not given	Bulk oil	July 1, '17
No. 150	5,950	11	Not given	Cargo	May 20, '17
No. 151	5,950	11	Not given	Cargo	June 20, '17
No. 152	6,200	11	Not given	Cargo	July 31, '17
No. 153	6,200	11	Not given	Cargo	Oct. 1, '17
No. 17	3,600	9½	Willy C. Gilbert.....	Cargo	Mar. 30, '17
Willamette Iron & Steel Works & Northwest Steel Co.: John Erland	5,700	10½	John Erland	Cargo	April, 1917

were all larger than this. The greatest number of arrivals from an European country was from Great Britain, from which 24 American ships of 95,936 net tons were entered, 17 of them at New York. So far as the statistics show, no American ship coming from Europe was entered at a Pacific coast port. The largest American ships recorded were the sister ships MANCHURIA and MONGOLIA, formerly belonging to the Pacific Mail, of 8,750 net tons each. These were operated in the service of the Atlantic Transport Line.

American vessels coming from other European countries were as follows: France, 15 ships of 50,514 net tons; Italy, 15 ships of 50,373 net tons; Scandinavia, 14 ships of 30,167 net tons; Spain and Portugal, 10 ships of 21,341 net tons; Holland, three ships

Only one American ship arrived from Japan, SEWARD, of 2,080 net tons, during the period under review, docking at Seattle. Seven American ships entered from China, having an aggregate net tonnage of 15,336, while three steamships flying the American colors were employed in the carrying trade from other Asiatic ports. These were HONOLULAN of 4,068 net tons, SANTA ROSALIA of 3,488 net tons and CITY OF MEMPHIS of 3,931 net tons, arriving respectively at Seattle, Boston and Philadelphia.

Situation is Improving

Attention is called by the department of commerce to the fact that before the war the flag was carried principally by the four American Line and two Red Star Line mail steamships to Great Britain and

markable gains in exports carried under the British, Italian, Japanese and Norwegian flags. The greatest proportional increase was recorded in Japanese shipping, which expanded from \$3,700,000 in May of last year to \$19,100,000 in this May, or approximately 400 per cent. For the 11 months the Japanese increase was from \$30,800,000 to \$118,200,000, or little less than 300 per cent.

The increase in exports carried in British vessels was from \$140,000,000 to \$225,000,000 for May and from \$1,252,000,000 to \$1,894,304,000 for the 11 months' period. Trade in Italian vessels recorded marked advances during the year, from \$67,000,000 to \$130,000,000 for the 11 months and from \$6,000,000 to \$14,000,000 for May. A similar expansion is shown in the figures on Norwegian steamers with

Table XI.
Comparison of American and German Ship Building Capacities

AMERICAN YARDS, JULY 1, 1916.			GERMAN YARDS, DEC. 31, 1913.		
Company.	Number.	Gross tons.	Company.	Number.	Gross tons.
Union Iron Works, San Francisco, Cal.....	29	201,158	Blohm & Voss, Hamburg.....	3	129,000
New York Ship Building Co., Camden, N. J.....	16	115,478	Weser Co., Bremen.....	14	110,500
Newport News Co., Newport News, Va.....	16	111,947	Bremen Vulkan Co., Vegesack.....	12	110,000
Fore River, Quincy, Mass.....	10	73,000	Tecklenberg Co., Geestemunde.....	12	93,400
Cramp & Sons, Philadelphia, Pa.....	11	75,700	Flensburg Co., Flensburg.....	14	88,560
Harlan & Hollingsworth, Wilmington, Del.....	14	62,555	Schichau Co., Dantzie.....	2	70,400
Maryland Steel Co., Sparrows Point, Md.....	10	58,705	Howaldtswerke Co., Kiel.....	5	38,080
Chester Ship Bldg. Co., Chester, Pa.....	11	53,600	Neptun Co., Rostock.....	6	27,000
Construction & Dry Dock Co., Seattle, Wash.....	7	42,600	Vulkan Co., Stettin.....	1	19,300
Skinner & Eddy, Seattle, Wash.....	6	35,720	Vulkan Co., Hamburg.....	1	18,000
American Ship Bldg. Co., Cleveland, O.....	16	33,600	Kook Co., Lubeck.....	2	15,810
Standard Ship Bldg. Corp., New York, N. Y.....	6	28,800	Seebeck Co., Geestemunde.....	5	15,545
Willamette Steel Co., Portland, Ore.....	5	28,500	Rickmers Reismuhlen Co., Bremerhaven.....	3	15,480
Texas Steamship Co., Bath, Me.....	4	26,000	Reihersstieg Co., Hamburg.....	2	15,600
Dry Docks & Ship Bldg. Co., Baltimore, Md.....	7	24,500	Stettin Oderwerke Co., Stettin.....	8	11,745
Great Lakes Engineering Co., Detroit, Mich.....	7	16,840	Frerichs & Co., Finswarden.....	2	11,100
Moore & Scott Iron Works, Oakland, Cal.....	3	16,000	F. Krupp Co., Kiel.....	1	9,600
Pusey & Jones Co., Wilmington, Del.....	6	9,600	Luxemburg Co., Emden.....	2	7,450
Manitowoc Ship Bldg. Co., Manitowoc, Wis.....	4	9,500	Nuscke & Co., Stettin.....	3	3,950
Toledo Ship Bldg. Co., Toledo, O.....	4	7,200			
Staten Island Ship Bldg. Co., Port Richmond, N. Y.....	2	4,400			
Merrill-Stevens Co., Jacksonville, Fla.....	1	1,700			
Total.....	195	1,037,103	Total.....	104	810,520

The New York Ship Building, Newport News, and Fore River yards were also building battleships, and the Cramps destroyers.

The Weser Co., Hamburg Vulkan, Howaldtswerke, and Schichau yards were also building battleships; Blohm & Voss, battle cruisers; and Vulkan Stettin, torpedo boats.

aggregating a net tonnage of 9,340. Arriving from Africa were seven ships of 15,040 net tons, three of which were bulk oil steamers. The direct trade which has been built up between the United States and Africa has been carried on principally by British steamships, although the share of the United States has been larger than the above figures indicate, as American sailing vessels have engaged in the trade. In view of the fact that consular reports in past years have emphasized the absence of American ships from African ports, the record is interesting, although it does not show that American ships have gained largely. That the American merchant marine is weak on the Pacific is shown by the figures of ships entered from China, Japan and other Asiatic ports.

Belgium, the five Pacific Mail liners to Asia and the three Spreckels' Line mail steamers to Australia. The continued gain in the export trade of the country which is being carried in American bottoms, together with the general advance in shipping under the flags of all nations, is shown in figures for May which have been made public by the bureau of foreign and domestic commerce. For May alone the increase was from \$30,000,000 to \$49,000,000, while for the 11 months ending in May the gain was from \$256,000,000 to \$429,000,000. The expansion for the month as compared with the same month last year was approximately 65 per cent, while the advance for the longer period was about the same percentage. The statistics contained in the monthly summary show also the re-

an increase in May from \$13,800,000 to \$32,800,000, while for 11 months the statistics show a gain from \$144,000,000 to \$218,000,000. While the total value of the import trade carried in vessels of different nationality is considerably less than the export, the figures show approximately the same proportion. The gain in American vessels was from \$30,000,000 to \$47,000,000 for May, and from \$251,000,000 to \$387,000,000 for the 11 months. The increase in British steamers was not so marked as in the case of exports, with an expansion for May from \$54,000,000 to \$80,000,000, and for 11 months from \$628,000,000 to \$762,000,000. A continued advance is shown in Japanese shipping for both May and the longer period, with increases from \$7,000,000 to \$19,000,000 for the one

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and from \$60,000,000 to \$154,000,000 for the other.

Table XII gives a comparison of the value of exports and imports carried under the flags of the different nations for May and for the 11 months ending with May.

The American ship building industry provides for three distinct kinds of navigation—ocean navigation, navigation on the Great Lakes, and on our extensive river systems. The unusual increase of American steel merchant ship building at the present time is wholly in the building of ocean-cargo steamships. Of the 385 steel vessels, of 1,225,784 gross tons, building or ordered in American ship yards on July 1, 1916, 195 vessels, aggregating 1,037,103 gross tons, are ocean merchant steamships of 1,000 gross tons or over. While this output is about half that of British yards in times of peace, it exceeds the amount of similar merchant ship building in Germany at the date of the greatest activity of the industry in the history of that empire, on Dec. 31, 1913. The bureau of navigation has prepared the comparison, shown in Table XI, of the number and gross tonnage of ocean steel merchant steamships of 1,000 gross tons or over building or ordered in American yards on July 1, 1916, and in German yards on Dec. 31, 1913, the date of maximum activity for the two countries in this form of industry.

American Cargo Boats and Tankers

Only eight of the American steamships, aggregating 52,328 gross tons, are for passengers and cargo, the largest being the Matson line steamer WAKIKI, 501 feet long, twin screws, turbine engines and 10,000 horsepower, of 9,728 gross tons, for the Hawaiian and possibly the transpacific trade. Two 8,000-ton passenger and cargo steamships of 17 knots speed are building for the Atlantic, Gulf & West Indies Co., one coastwise passenger ship of 6,000 tons, 14 knots, for the Mallory Line, two 5,800-ton steamships, 13 knots, for W. R. Grace & Co. for trade to the west coast of North and South America, and two coastwise steamers, 4,500 tons each, 12½ knots, for the Savannah Line.

The remaining tonnage is almost evenly divided between 72 steamers, of 496,138 gross tons, building especially to carry oil in bulk, and 115 steamers of 488,637 gross tons, building to carry cargo generally. The use of oil as fuel for some years past has been growing rapidly both on sea and land. The newest types of American battleships are oil burners and many British warships use this fuel. Doubt as to whether the ad-

vantages of oil as fuel on warships might not be more than offset by the added risk of explosion and fire in battle seem to have been dispelled by the results of the naval battle of Jutland in which British warships using oil fuel were engaged. The use of oil as fuel on American merchant steamers, especially on the Pacific, is increasing, and in replacing merchant shipping destroyed by the war both the belligerent and the neutral nations will undoubtedly use oil-burning machinery extensively. That half

next nation being the Netherlands with 87,080 gross tons. The ships for general cargo building in the United States are adapted in size, power and construction to carry bulk cargoes to any part of the world. In short, the steel ocean steamers now building in the United States are adapted not only to present conditions but also when completed, to conditions likely to obtain after the close of the European war.

German Tourist and Emigrant Ships

In Germany, 21 steamships, of 385,000 gross tons, nearly half of the German tonnage building at the beginning of 1914, were passenger steamships, including the following Hamburg-American and North German Lloyd liners for the American tourist and northern European and Russian emigrant trades: BISMARCK, TIRPITZ, VATERLAND, ZEPPELIN, BURCHARD, HINDENBURG and COLUMBUS. These seven ships of from 18 to 24 knots speed, aggregating 236,200 tons, were building also as naval auxiliaries and commerce destroyers, but, so far as completed, remain in port. The totals include also the Hamburg South American liner and commerce destroyer CAP TRAFALGAR, sunk in battle by the Cunarder CARMANIA, and her sister ship CAP POLONIO, launched in March, 1914, and reported still building. Smaller passenger ships were three for the German East Africa line (19,400 tons) and five for the Oldenburg line to Portugal (10,600 tons).

The cargo steamers building numbered 83, of 425,000 gross tons, of which six, aggregating 40,000 tons, were to be put in the Australian trade in 1914 by the North German Lloyd, and seven, of 8,000 tons each, in trade with East Asia, Japan and Kaiochow. The Deutsch-Australia Line was building seven of 36,500 tons in all, the Hansa Line, for trade with British India and South America, 14, of 92,500 gross tons, and the Kosmos Line seven, of 50,000 gross tons. Seven oil tank steamers, aggregating 45,600 tons, were building for trade with America and Roumania. Excepting small cargo boats, the remainder of the cargo steamers were building for the Hamburg-American company. Except VATERLAND, CAP TRAFALGAR and cargo steamers, completed before August, 1914, ships building or ordered in Germany on Dec. 31, 1913, as shown by the Germanischer Lloyd, Hamburg-American and North German Lloyd reports for 1913-14 were yet building in Germany on June 30, 1916, according to the Copenhagen cabled interview of that date with Herr Ballin, general manager of the Hamburg-American Co.

Table XII.

American Exports and Imports

EXPORTS (000 OMITTED).

	—May—		11 mos. end.	
	1915.	1916.	May,	1916.
American vessels	\$30,114	\$49,879	\$256,259	\$429,311
Foreign vessels:				
Austrian	.....	.....	877	.....
Belgian	526	4,227	13,229	29,232
British	140,119	225,179	1,252,115	1,894,304
Danish*	.....	6,706	.....	57,806
Dutch	13,013	13,206	99,434	103,868
French	16,874	19,696	117,987	160,734
German	.....	.....	19,917	.....
Italian	6,787	14,701	67,208	130,003
Japanese	3,704	19,197	30,807	118,238
Norw'g'n	13,822	32,887	144,780	218,594
Spanish*	.....	3,471	.....	49,555
All other	19,181	28,366	194,537	188,645
To. Fr'n	214,030	367,642	1,940,895	2,950,982

*Not stated separately prior to Jan. 1, 1916.

IMPORTS (000 OMITTED).

	—May—		11 mos. end.	
	1915.	1916.	May,	1916.
American vessels	\$30,140	\$47,602	\$251,344	\$387,320
Foreign vessels:				
Austrian	.....	.....	3,023	5
Belgian	5	236	6,307	2,834
British	54,214	80,779	628,730	752,548
Danish*	.....	6,926	.....	45,813
Dutch	9,723	14,334	115,830	93,554
French	5,271	7,533	63,012	80,289
German	18	.....	31,062	340
Italian	4,127	3,779	45,621	42,023
Japanese	7,732	19,405	60,418	154,326
Norw'g'n	13,581	18,548	101,400	126,871
Spanish*	.....	1,750	.....	12,856
All other	6,080	8,460	75,312	73,470
To. Fr'n	100,755	161,753	1,130,782	1,384,935

*Not stated separately prior to Jan. 1, 1916.

of the tonnage of ocean cargo steamers building in the United States is made up of "tankers" is thus an evidence of judgment in anticipating the lines of development of American trade as a purveyor of modern fuel and incidentally a provision for one of the greatest future needs of the navy. The American merchant fleet already includes 102 tank steamers of 459,656 gross tons. If the tankers now building in the United States sail under the American flag, in its oil-carrying fleet, the United States will rank first, British tank tonnage numbering 208 steamers of 875,909 gross tons, the

In the Traffic Manager's Office

A Review of the Month on Coasts and Lakes—Useful Pointers
for the Men Who Get the Business

How Japanese Control Pacific Trade

BY R. C. HILL

WITH the taking effect of the Seamen's act coupled with the shortage of tonnage, high freights and other conditions due to the war in Europe, there has developed on the North Pacific a formidable fleet of Japanese freighters. It can safely be stated that Nipponese tonnage now dominates the trade of the North Pacific. The Japanese owners have taken full advantage of existing conditions and those who look to the future predict that the little brown men of the Orient will continue to hold sway over the water borne commerce from the ports of the North Pacific, for some time at least.

The Seamen's law, which has so seriously handicapped American shipping and to some extent affected the vessels of foreign countries, is not injuring the Japanese in the slightest degree. This is due principally to the fact that the language test does not apply to the Nipponese vessels because, the entire crew being of one race, every member can easily understand the commands of the officers. Consequently the Seamen's law, instead of unionizing the seamen of every nation as the Sailors' Union of the United States hoped it would do, has practically encouraged and aided the Japanese in taking a strangle hold on the shipping of the North Pacific.

Japanese shipowners have profited immensely by the high freights of the past year. In fact Japanese yards are filled with tonnage under construction. It is very evident that the Japanese intend to push to the limit their present advantage and, once securely entrenched in control of the commerce of the Pacific, it will be next to impossible to dislodge the Oriental competitors. Even the British tramp which, before the war, carried the bulk of the Pacific trade, is losing out in this stern war for business and when the British return to commercial pursuits after the difficulty in Europe is settled, they will

find the Japanese in possession of the rapidly growing trade across the broad Pacific. In the event of low freights or a depression in shipping, it will be found that the Jap will be fully capable of holding his own. He can compete successfully with any other maritime nation because with low wages and low operating expense, he can operate with freights at the lowest ebb and under conditions which would drive other owners into bankruptcy.

No American Ships

During the past six or nine months, more Japanese steamers have called at Puget Sound ports than in years before. British tramps have been operating elsewhere, Norwegian tonnage has been attracted to other trades and the few American vessels available for offshore commerce have been negligible in number. Consequently the Japanese have strongly entrenched themselves and they are now in position to use their advantage to their own permanent profit and prestige.

Many steamers now flying the Japanese flag, were formerly British for the Japanese have been extensive buyers of second hand tonnage. Still the Nipponese fleets are not composed entirely of bottoms discarded by other nations. The Japanese have in the meantime been busy builders and many of their vessels are fine, new ships, modern in every respect and able to hold their own under the most severe competition. Some of the new Japanese vessels are small steamers of 1,000 tons net or under. They have been constructed in record time, some of them having been assembled at Japanese yards in three months or less. Critical shipping men scoff at these vessels which they refer to as "tin kettles" which have been "thrown together." Nevertheless, these little tramps are plying the Pacific and in some instances paying for their construction in six months, under the unprecedented

freights which have prevailed for months.

During the past six months, Puget Sound has built up an unprecedented commerce with the Orient, particularly Vladivostok. With Archangel closed, the Russian government found that Puget Sound was the ideal port through which to ship its thousands of tons of war material and general supplies purchased in this country. Since June 1 this trade has dropped off but it is expected to resume activity again in the fall. While there will not likely be as much war material to be sent in future, a trade that is expected to be permanent has been built up with Siberia, while the commerce with Japanese, Chinese, Philippine and Straits Settlements ports has enjoyed an activity hitherto unknown. In all this period of record business by water, the Japanese freighter has profited. The following table showing clearances from Puget Sound and Vancouver, B. C., during the first six months of 1916 will give an idea of the extent of this great trade which has been more than treble the normal:

Month, 1916.	Number of steamers cleared for Orient.	Net tonnage.
Jan.	14	44,054
Feb.	14	44,003
March	17	52,959
April	11	34,416
May	28	89,560
June	16	52,853
Totals	100	317,845

In nationality this great fleet was divided as follows, as to number of vessels: Japanese, 73; British, 12; American, 10; Norwegian, two; Russian, two; Mexican, one. Thus it is easily seen that of the vessels sailing for the far east in the last six months, the Japanese furnished 73 per cent.

In net tonnage this fleet was divided as follows: Japanese, 222,431 tons; British, 59,901; American, 21,621; Norwegian, 6,526; Russian, 5,136; Mexican, 2,230. These figures prove that in net tonnage the Japanese flag had approximately 70 per cent. These tables include the regu-

lar lines of the British and Japanese fleets. During the last three months several of the steamers of the Canadian Pacific, which had been commandeered by the British admiralty, returned to regular service so that the proportion of British tonnage in April, May and June was much larger than in the first three months of the year. The showing for June is small, comparatively speaking, because of labor troubles in that month. This condition accounts for the fleet of 17 steamers of 57,913 net tons in Puget Sound ports on July 1.

Interruption of trade with Europe, due to the war, has stimulated general commerce with the Orient and there has been a great increase in the importations of oils, rubber, tin, sugar beet seed, licorice, cereals and other products of the far east. The Japanese steamers have profited in this increase business as well as in the transportation of supplies for the Russians, all of which have been carried at enormously profitable rates.

Despite serious labor troubles, Seattle's overseas, Alaska and coast-wise commerce for June, 1916, showed an increase of more than \$19,000,000 compared with the same month last year. To be exact the increase was \$19,181,083, the total value of the commerce of this port for June being \$37,918,383 as against \$18,737,300 in June, 1915. The greatest expansion in this port's business is shown in trade with Asiatic Russia and Oriental ports. The value of Seattle's commerce with Vladivostok during June was \$8,317,032 as compared with \$752,715 in June, 1915. Oriental commerce reached the total of \$1,815,466. During June, 1915, this figure was \$676,623.

Dutch Shipping Company Opens Branch

Permanent offices of the Ph. van Ommeren Corporation, of New York, general shipper and forwarder, recently organized, have been opened at 42 Broadway. The corporation represents the firm of the same name which has its headquarters in Rotterdam and branches in London, Amsterdam, Antwerp and Batavia, Java. William H. Scholz, lately attached to the American legation at The Hague as commercial adviser, is in charge of the New York office. Mr. Scholz said recently:

"The company plans to develop trade with the Dutch East Indies and with Holland. Owing to the disorganization of shipping conditions arising from the war, we are unable to employ our ships on the routes where we would like to operate them and

are running services from New York to Brazil, from New York to Spain and Portugal, and from New York to the Dutch East Indies. Many of our ships are now under requisition by the Netherlands government, either for relief service or to carry commodities to Holland. These vessels will be used, when released, in a service between New York and Rotterdam. After the war the regular service between New York and the East Indies via the Suez canal and between the Indies and San Francisco, direct, will be augmented by additional ships.

"The company's operations will not be confined to shipping and forwarding, but we will also engage in a general commercial business, buying and selling commodities both here and in Holland. We believe that the field for development in this trade is large, and that it presents opportunities for all interested."

The Ph. van Ommeren Corporation owns a large number of cargo vessels and tank steamers, in addition to a fleet of from 60 to 70 ocean-going lighters, which includes some of the largest craft of this type.

Back in Pacific Under Jap Flag

The steamship *SIBERIA*, formerly of the fleet of the Pacific Mail Steamship Co., and sold by the latter to the Atlantic Transport Co., for service between Great Britain and New York, passed through the Panama canal a short time ago on her way back to the Pacific under the house flag of the Toyo Kisen Kaisha. She has been registered in Yokohama and will be operated in the service between the United States and the far east.

SIBERIA is the largest ship to have passed through the canal since its re-opening. She is 552 feet in length by 63 feet beam and was drawing 29 feet forward and 29 feet 7 inches aft at the time of passing through the cut. Excepting the sister ships *FINLAND* and *KROONLAND*, *SIBERIA* is the largest ship which has ever passed through the canal. Her displacement tonnage is rated at 18,000.

SIBERIA came to Balboa from San Francisco on Oct. 10, 1915, but was unable to make the transit of the canal on account of the slides. She and her sister ship *KOREA*, which had arrived at Balboa one week before, proceeded to the Atlantic by way of the strait of Magellan. *KOREA* is expected to return through the canal within a short time, having likewise been sold to the Toyo Kisen Kaisha.

The price of *KOREA* and *SIBERIA* in the recent sale is reported as \$2,000,000 each. When they were sold last October by

the Pacific Mail the company received slightly over \$5,000,000 for the two and also *CHINA*, *MANCHURIA* and *MONGOLIA*. *MANCHURIA* and *MONGOLIA* are larger and finer ships than *SIBERIA*; they are rated at 28,000 tons displacement.

SIBERIA was carrying a general cargo, amounting to 6,579 tons, from New York direct to Vladivostok. She has no passengers but carried a crew of 146.

Motor Boat for Railroad

The Lehigh Valley railroad has added to its floating equipment in New York harbor a 32-foot gasoline power boat capable of making 12 miles an hour. *SCOUT*, as the boat has been named, carries an operator, who has a pilot's license, and an inspector who was formerly known as a "runner," one of a number employed by the railroads entering New York who must lighter their freight from Manhattan and Brooklyn piers. The runners are used by the railroads to check up on their car floats, grain boats, lighters and barges placed in the slips and at piers up and down the New York and Brooklyn shores. They are men in authority who can solve problems for the boat captains, see that the greatest efficiency is being gotten out of the boats and that no time is being wasted in their loading and unloading. Heretofore a number of these runners have been employed by the Lehigh Valley. The management decided to experiment with a power boat in this connection and the experiment has proved an immediate success.

All of the runners have been replaced by one man, and for the first time the Lehigh Valley has been able to have a daily report on all its boats scattered along the metropolitan water front. The result has been not only a saving financially, but a considerable gain for the railroad and its shippers. *SCOUT* is a sturdily built craft drawing only 4 feet of water and may be used also for inspection and other purposes in waters which might not be reached by one of the company's tugs.

Service Between San Francisco and West Indies

Direct steamship service between San Francisco and the West Indies, with Havana, Cuba, as the principal port of call, was inaugurated via the Panama canal recently by the steamship *PENNSYLVANIA* of W. R. Grace & Co., San Francisco. A large part of the cargo consisted of Asiatic rice, but large quantities of California goods, notably canned products, were also carried. *PENNSYLVANIA* may be followed shortly by the steamship *CACIQUA* of 10,000 tons capacity.

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Business Booming on the Delaware

By Joseph Fenerty

THE discovery of a pre-constitutional statute of agreement between Pennsylvania and New Jersey, dated Sept. 20, 1783, wherein the two states settled the jurisdiction of the Delaware river by giving concurrent authority over the water to both states, is a fruitful topic of discussion in and about the port of Philadelphia. It was generally believed that the river was under federal jurisdiction. The discovery was made by John Frederick Lewis, marine lawyer and authority on international law, and was announced on July 25. The question of jurisdiction was raised in connection with the trip of an excursion boat to Augustine beach, on which vessel, it was said, the passengers behaved in an untoward manner. The affair was brought to the attention of United States district attorney Francis Fisher Kane, who referred the violation of law on the river to the Philadelphia district attorney's office. That office shifted it back to Mr. Kane. The federal constitution prohibits such compacts between states, but Mr. Lewis points out that, being a pre-constitutional agreement, it is consequently without the prohibition of that document.

PALISADES, a unique excursion boat with sides and top entirely of glass, made a successful trip from the Mathis Ship Building Co.'s plant at Cooper's Point, N. J., and has been turned over to the owner, the Palisades Co., for operation on the Hudson river. The vessel was built for George W. Perkins, New York banker, and presented by him to the company. She is 150 feet long and will be commanded by Capt. Kane. Oil-burning engines are installed.

Furness, Withy & Co., Philadelphia, have taken possession of the Dock street municipal pier on a lease of \$19,000 a year. It will be used in loading outbound cargoes.

The new harbor refuge at Cape May was formally opened on July 4. It affords opportunity for craft of 23 feet draught to avail themselves of harbor behind Sewell Point. It is in a more available position for outbound tows than the Delaware breakwater.

The captains and owners of oyster boats in the Maurice river cove, N. J., have made formal protest against, and have asked the repeal of, the New Jersey law prohibiting the hiring of help outside of that state. Recently, the oyster schooner of Capt. Charles Bradford, Newport, was confiscated for alleged violation of the old statute for-

bidding employment to non-residents. The oystermen say that it is impossible to find sufficient resident help.

President John P. Virdin, of the Pilots' Association for the Bay and River Delaware, has presented to the commissioners of navigation a communication from his organization asking that a resolution be adopted to prevent the acceptance of any more pilot apprentices at the present time. A similar resolution was recently adopted by the board of Delaware pilots. The pilot service now consists of 32 pilots and 4 apprentices working under the Pennsylvania laws and 42 pilots and 2 apprentices under the laws of Delaware.

The differences between the striking riveters and helpers and the New York Ship Building Co., at Camden, N. J., have been satisfactorily adjusted.

Capt. John K. Gibson has been appointed master of the new steamship J. M. DANZIGER, now approaching completion at Cramp's ship yard, Philadelphia, for the Pan-American Petroleum & Transport Co. Capt. Gibson has commanded steamers on both the Atlantic and Pacific. He began his sea career on a sailing vessel when 17 years old. He has served in the United States navy and also sailed the bark-rigged yacht APACHE in the German emperor's regatta, off Kiel, in 1905. The Pan-American company has under construction a fleet of 12 tankers.

Efforts are being made by the larger hotel owners of Atlantic City, N. J., to revive the Atlantic City Steamship Co. to carry passengers and freight between Philadelphia and the seaside resort. The possibility of cheaper freight transportation is, however, the important consideration back of the project.

The first cargo of coal ever shipped from Philadelphia for Greenland left the city on July 22, for Ivigtut. It was carried by the Norwegian steamer THELMA and consisted of 700 tons of Pennsylvania bituminous coal to be used in mining cryolite.

The Atlantic deeper waterways association will hold its ninth annual convention in Philadelphia on Sept. 12-15.

The Alaska Steamship Co. will begin passenger and freight service between Philadelphia and Puget Sound ports late in the autumn. The first steamer will be ALASKA, sailing from Seattle on Nov. 22. She will stop enroute at San

Francisco, San Pedro, San Diego, Panama, Colon, Kingston, Santiago and Havana, making the voyage in about 27 days. Sufficient freight has been assured to make the line profitable but the passenger service will have to be developed.

An ocean-going tug for the New York Central railroad was launched at the ship yard of the Pusey & Jones Co., Wilmington, Del., recently.

The oil-tanker BRAMEIL POINT, one of several now under construction for the Vacuum Oil Co., has been launched at the plant of the Harlan & Hollingsworth Corporation, Wilmington, Del.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has contracts for 12 vessels, aggregating \$12,600,000.

Naval architects recently paid a visit to the Italian steamship MILAZZO, described in the July issue of *The Marine Review*. She arrived in Philadelphia during July.

Great Lakes Notes

By A. A. Eiben

IMPROVEMENTS in the stage of water on the Great Lakes, together with excellent dispatch obtaining at loading and unloading ports, are enabling vessels to establish new records. During the past month the steamer WILLIAM P. SNYDER JR. broke the ore carrying record when she loaded 13,694 tons at Duluth and delivered her cargo at Ashtabula. SNYDER JR. also has established a new coal cargo record, having carried 14,409 tons of coal from Ashtabula to Duluth.

That vessels in the coal and ore trades are securing wonderful dispatch is exemplified by the performance of the steamer COL. J. M. SCHOONMAKER late in July. This vessel arrived at Superior on Saturday morning at 5 o'clock with 13,904 tons of coal. She unloaded, went to Duluth, took on 12,757 tons of ore, and sailed for Lake Erie at 4:30 o'clock Monday morning. This indicates that SCHOONMAKER handled over 26,000 tons of freight in less than 48 hours, meanwhile shifting from one dock to another. SCHOONMAKER and SNYDER JR. are both owned by the Shenango Steamship & Transportation Co., Cleveland.

The steamer SEXTANT, building for Norwegian owners, was recently launched at the yard of the Great Lakes Engineering Works. SEXTANT is full Canadian canal size.

July ore receipts at Ashtabula established a new record for monthly figures. During that period, 1,707,072 tons of iron ore were received, a gain of 10,155 tons over the June record.

It is reported that wrecking operations on the steamer *CHARLES S. PRICE*, on the bottom of Lake Huron about 11 miles above Port Huron, may be abandoned. A survey made recently by Capt. Alex Cuning, who is in charge of the work, indicates that the machinery of the vessel has been destroyed, the boilers are out of the hull and all the bulkheads from the cargo hold aft are carried away. It is stated that the bow could be lifted with air with comparative ease, but with the machinery and boilers gone and the stern badly battered, it is doubtful whether the wreck would be worth much if salvaged. The Great Lakes Towing Co. took the contract for floating the steamer for \$98,000 or a percentage of the value of the ship, on the no-cure-no-pay plan.

The Cleveland-Cliffs Iron Co. has made some additional changes in the names of vessels in its fleet. The steamer *EUGENE ZIMMERMAN* has been renamed *GRAND ISLAND*, and the *F. M. OSBORNE* has been changed to *MUNSLING*.

Several serious collisions have occurred on the Great Lakes during the past month. Notable among these was the collision between the steamers *NOTTINGHAM* and *W. GRANT MORDEN*, in a dense fog, above Whitefish Bay, Lake Superior. *NOTTINGHAM*, upbound, light, struck *MORDEN* on the port bow just forward of the wheel house, damaging the latter considerably above the water line. *MORDEN* was temporarily repaired at the Soo, losing a week's time. *NOTTINGHAM* sustained the greater injury, her stem being twisted back almost its entire length. She was repaired at Toledo and was out of commission two weeks. The steamers *SIERRA* and *EMPIRE CITY* collided at Algonac, St. Clair river. Both vessels were badly damaged and lost considerable time making repairs. Another collision which caused considerable damage to both vessels was that between steamer *MARQUETTE*, formerly *E. L. WALLACE*, and the steamer *J. T. KOPP*, in the lower Detroit river. *MARQUETTE* was out of commission three weeks, while repair work on the *KOPP* delayed her about two weeks.

On Puget Sound

By F. K. Haskell

DESPITE serious delays caused by the longshoremen's strike, Seattle's overseas, coastwise and Alaskan commerce for June showed an increase of more than \$19,000,000, compared with the same month last year. The total value of the commerce of the port for June, 1916, was \$37,918,383, against \$18,737,300 in June, 1915.

The North Pacific Ship Building Co. has been incorporated at Portland, Ore., with a capital of \$100,000. It will operate in conjunction with the Smith & Watson Iron Works and the Northwest Steel Works, where all machinery for the vessels will be constructed.

Articles of incorporation have been filed by the Seaborn Ship Yard Co., Tacoma, Wash. The trustees are C. N. Seaborn, Tacoma; Phillips Morrison

and J. F. Ostrander, Seattle. The company has a capital stock of \$10,000 and will engage in the general ship yards and ship building business.

The power freighter *CHACO*, built for the Island Transportation Co. at the yards of John Martinovich at Dockton, Wash., was launched recently. The new vessel is 65 feet long and will be equipped with an 80-horsepower Winton marine gas engine. *CHACO* will have the pilot house control system. The freighter will cost \$8,000 and will ply between Seattle and island points.

Nine years ago the splendid 5,000-ton steel freight and passenger steamer *SESOSTRIS*, operated by the Kosmos line, was loading a cargo of coffee at Ocas on the Pacific shores of Guatemala. A great storm arose, which first cast the steamer adrift and then carried her on a sandy beach, where she has remained half buried ever since. The plight of

SESOSTRIS had been all but forgotten until shipping men, as the result of the European war, began to search harbors far and wide for tonnage. While north Pacific shipping men were searching for vessels, someone suggested *SESOSTRIS*, and now an expedition is being formed for floating the big German craft. The British Columbia Salvage Co. is outfitting the tug *PILOT*, which will leave for the south with a party of salvage experts aboard. Capt. W. H. Logan will be in charge. The salvage steamer *SALVOR* may accompany *PILOT*. The natives are said to have dug the vessel out of the sand, forming an artificial lake. In order to get *SESOSTRIS* into deep water, a channel, half a mile long, will have to be dug.

The American schooner *ALBERT MEYER* was purchased by J. E. Shields, Seattle, when 18 days out from Melbourne, Australia, for Papeete. The vessel was formerly operated as a fishing schooner by the Alaska Codfish Co.

The Mississippi Delta

By H. H. Dunn

ANTICIPATION, by First Chief Carranza of Mexico, of war with United States has brought damage of more than \$300,000 to shipping interests on the Gulf of Mexico, through the darkening, by his orders, of light-houses on the many reefs which mark the Mexican coast. The steamer *FREDA*, from New Orleans, laden with grain and hospital supplies, and chartered to the Caribbean & Southern Steamship Co., went on Alacran reef, on the coast of Yucatan, 12 miles from the Alacran light, which was dark. The vessel and cargo represent \$400,000, and while much of the cargo will be saved, the ship is badly damaged. The second vessel to meet a like fate is *CARIARIN*, a large schooner, of Pensacola, which was destroyed on the same reef, owing to the darkening of the light, on the night of July 7. Capt. Sullivan, of the wrecked schooner, and his crew of 10 men, have been brought to New Orleans by the Norwegian steamer *NORDAMERIKA*. *CARIARIN* and her cargo represent a loss of about \$75,000.

The former revenue cutter, *WINONA*, has been sold by W. M. Evans, Mobile, Ala., to Francisco Negra, a wealthy cattle raiser of Cuba, for \$30,000. Negra also bought the steamer *LOUIS DOLIVE*, and will put both boats in the Cuban cattle trade. The revenue cutter *TALLAPOOAS* replaced *WINONA* on the Mobile section of the Gulf coast.

Monroe, La., was cut off from river traffic for about a week by low water. Even the shallow-draft packets were unable to reach the town.

The Mobile & Gulf Navigation Co. will start a line of steamers between Mobile and Cuban ports about Sept. 1, according to an announcement by P. E. Chalifoux, Birmingham, president of the company. Later, the company plans to operate steamers to Central and South American ports.

Engineering officers of the United States army are seeking means to deepen Southwest pass—one of the mouths of

the Mississippi—to 35 feet, for a width of 1,000 feet, according to newspaper announcements in New Orleans. Conferences have been held between these engineers and Major Edward H. Schultz, in charge of government engineers in the Crescent City district. Examination and survey of Southwest pass were made by army engineers last March.

The steel barque, *JUANITA*, 100 days overdue and 40 days unheard from, reached New Orleans July 28. Villa & Co., owners of *JUANITA*, had practically given up hope of her arrival when she came in through the passes. She was directly in the path of the big storm, and was last heard from off Dry Tortugas, June 20, from where she should have arrived in New Orleans in 12 days. The hurricane did not hit the big barque according to the captain, but she met with other gales and with calms which kept her from making port for 100 days past the date she was due. *JUANITA* was in sand ballast, coming over for staves. In one of the storms the sand in the hold began to shift, forcing the crew to work with shovels all one day to keep her from going over. Villa & Co. have purchased five new sailing vessels for the slave trade between New Orleans and Barcelona.

The steamer *RUTH*, first large vessel ever built in Mobile, was launched on the morning of July 29, at the docks of the Gulf City Boiler Works. *RUTH* was built for the Texas Oil Co. and will go into service at Port Arthur, Texas.

The schooner *Rowe*, with captain and crew of six men, has returned to Gulfport, after having been blown 300 miles out of her course and given up for lost.

The seamen's law has prevented eight steamers of the Mexican Navigation Co. from coming under the United States flag, according to Gonzalo Abaunza, general manager of the company. One of the vessels, *TABASCO*, has been transferred from Mexican registry to Cuban, as the Cuban Navigation Co., a \$3,000-

000 concern, is to succeed the Mexican Navigation Co. The remaining seven steamers of the fleet, MEXICO, SONORA, COAHUILA, TEHUANTEPEC, MERIDA, OAXACA and TAMPICO, will change registry to the new company within a week or two. General Manager Abunza admitted that his company wished to put his ships under the Stars and Stripes, "but," he said, "regulations of the new seamen's law, as our attorneys interpret them, provided that Americans be employed as officers on all ships under American registry. Our officers are Mexicans, and we do not feel that we should discharge men who have served us faithfully for years, just to win the right to American registry." Jose E. O'Kelley, formerly general manager for the Ward Line in Mexico City, is president of the Mexican Navigation Co. Carlos Parraga heads the Cuban Navigation Co., which is about to absorb the Mexican concern. The old company was under concession from the Mexican government to carry mails and perform certain other services, and was the largest steamship corporation under the Mexican flag. Ships of this line ply between New Orleans and Vera Cruz, Progreso, Tampico and Havana. The change in registry was made to avoid complications between the American and the Mexican government.

The Inland Navigation Co., whose installation of motor freight barge service between St. Louis and New Orleans was described in a recent issue of *The Marine Review*, has decided to operate each of its big self-propelled barges with a string of towboats as soon as the boats can be built or purchased. The motor barges themselves, handling an average of 1,500 tons of cargo each, can carry only high priced freight profitably. There has been, however, a large demand for water transportation for heavier and cheaper freight. With this in view the company, has decided to operate strings of barges like freight trains, dropping off a laden barge at the port to which it is consigned, just as a car of freight is dropped on a siding by a train. Three such barges have been purchased, at a cost reported to be \$20,000, from the Alabama & New Orleans Transportation Co., and will be put into service at once. Several other small barges are under construction. J. O. Gill, formerly traveling freight agent of the New Orleans, Mobile and Chicago lines, has been made manager of the Inland Navigation Co.'s interests in Memphis.

On the Chesapeake

By Hollis F. Bennett

THE Curtis Bay Towing Co. has purchased the steel tug DANDY from interests in Ferndina, Fla., and will add her to their growing fleet. DANDY was built by the John Dialogue Co. in Camden, N. J., in 1888, for the Alexander Jones Co., which was at that time the largest tug boat owner in the south. The Curtis Bay Co. operates the tugs CURTIS BAY and PORT COVINGTON which were formerly the New York tugs GERALD KELLAR and JACK DYKEMAN respectively.

The Northern Transportation Co., Baltimore, of which John T. Donohue is president, has ordered a new tug from the Spedden Ship Building Co.

Her keel was laid on July 11. The new vessel will be named NORTHERN. She will be the second largest tug on the coast, being exceeded in size only by the wooden tug PAUL JONES, owned by the Thames Towboat Co., New London, Conn. NORTHERN will be 160 feet in length over all, 26-foot beam and 16-foot hold. She will be driven by a triple-expansion engine with 21, 32, and 54-inch cylinders and 26-inch stroke, furnished with steam by two single-end Scotch boilers, each 12 feet in diameter and 11 feet long, working at 180 pounds steam pressure. NORTHERN will have a bunker capacity of 330 tons. The Spedden company has a second tug about ready for the same owner. This tug will be named JOHN T. DONOHUE. DONOHUE is 125 feet length over all, 25-foot beam and 14 feet depth of hold. She will be driven by fore and aft compound engines, with 16½ and 35-inch cylinders, and 26-inch stroke. One Scotch, single-end boiler 14 feet in diameter and 12 feet long, operating under 150 pounds steam pressure has been installed.

The Spedden company has finished rebuilding the burned sidewheel-steamer MARYLAND for the same owner. MARYLAND's hull was raised 6 feet and she was converted into a coasting tow-barge schooner rigged with two-pole masts.

A company has been formed in New

York to recover treasure and other valuables sunk in various ships. The first operations will be on the wreck of the Ward Line steamer MERIDA, 55 miles northwest of Cape Charles lightship. MERIDA was rammed by the United Fruit Co.'s steamer ADMIRAL FARRAGUT and silver bars and other valuables to the value of more than \$1,000,000 were lost. The company will operate the steamers FEARLESS and TITANIA, the wrecking steamer F. H. BECKWITH, a tug and a yacht. The operations will be directed by George D. Stillson, who raised the submarine F-4 in Honolulu harbor. The company is known as the Inter-ocean Submarine Engineering Co. Admiral Colby M. Cluster, U. S. N., retired, is president.

The Consolidation Coal Co. has purchased the lake built Steamship INLAND and is having the steamer overhauled in Buffalo prior to placing her on the Baltimore-New England coal routes. INLAND will replace CHAS. F. MAYER, recently sold to New York interests.

The Baltimore Dry Dock & Ship Building Co. has recently launched the first of four motor tank ships. The vessel was christened BRAMMEL POINT by Miss Elenor Evans, daughter of president H. A. Evans, of the Baltimore company, and is owned by the Vacuum Oil Co., New York.

Boston Bay a Lively Place

By George S. Hudson

STATISTICS prepared by F. W. Quinn, statistician of the Boston Immigration station, show that 13,714 aliens arrived at that port during the last fiscal year as compared with 21,513 arrivals for 1915. Most of the immigrants were Portuguese and Italians, women predominating and men over the military age. Deportations last year exceeded any recorded in history of the Boston station.

The steamship ATLANTIC, built several years ago at Quincy, Mass., for the Emery Steamship Co., has been sold to the Berwind-White Co. and is now loading a cargo of coal for a French port.

The four-masted schooner STANLEY M. SEAMAN, recently returned from Turk's Island with a cargo of salt, has been chartered to load case oil for Lisbon at 80c per case. The return cargo will be corkwood, loaded at a Portuguese port, \$5,000 lump sum.

Capt. T. R. Parker has been appointed assistant inspector of hulls at Boston to succeed A. W. Haines who has been transferred to New York. Capt. Parker had been employed previously by the Merchants & Miners Transportation Co.

Twenty million bushels of wheat were shipped to Europe from Boston during the first six months of the present year, breaking all export records. At least 16,000,000 bushels were consigned to the French, British and Italian governments.

The steamship EVANGELINE, chartered for one voyage from Boston to Manchester, Eng., has returned and will resume her run on the route to Halifax, N. S.

The auxiliary schooner ATHENA is bound to Boston from Seattle via the Panama canal after having been engaged in the Pacific halibut fishing industry several years. Another Boston fisherman, VICTOR & ETHAN, has returned from the West coast to engage in the ground fishery off the New England coast with market at Boston and Gloucester.

A contract has been awarded by the Shawmut Steamship Co., Boston, to a Chester, Pa., ship yard for a steamship to be delivered next June. The ship is designed for oversea trade, being the fourth owned by this company.

After having been wrecked in the Cape Cod canal by an accident to her steering gear the steamer WILLIAM CHISHOLM has had her cargo of coal pumped out prior to patching up the hull which was considerably damaged. CHISHOLM was bound from Newport News for Boston.

Complaint has reached the maritime committee of the Boston chamber of commerce that coastwise shipping is using the wrong side of the main ship channel indiscriminately. So troublesome has the infraction become that licenses of offending skippers may be suspended or revoked.

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Todd Shipyards Corporation, which was organized July 1 as a holding company for the Robins Dry Dock & Repair Co., New York and Brooklyn, the Tietjen & Lang Dry Dock Co., Hoboken, N. J., and the Seattle Construction & Dry Dock Co., Seattle, Wash., has opened offices at 15 Whitehall street, New York, and has been organized with the following officers: President, W. H. Todd; vice president, George Q. Palmer; secretary and treasurer, Carl R. Riedel. The three operating companies, although some changes have been made in their personnel, will continue to conduct their affairs as in the past. Despite rumors, there will be no consolidation of the purchasing or other departments of the three concerns. The officers of the Robins Dry Dock & Repair Co. are: President, W. H. Todd; vice president, George J. Robinson; secretary and treasurer, Carl R. Riedel. Officers of the Tietjen & Lang Dry Dock Co. are: President, George G. Raymond; vice president, Ernest Dendel; treasurer, Carl R. Riedel; secretary, Henry Frielinghaus. Recently the Seattle Construction & Dry Dock Co. was reorganized, for particulars of which see page 320.

Oxygen Company Expands

The International Oxygen Co., New York City, is installing a new plant at College Point, L. I., for manufacturing oxygen and hydrogen gas. It is expected that the installation will be completed late in August or early in September; after which the company's increasing trade in Brooklyn and its environs, as well as in Manhattan, will be largely handled from this point. This local business has previously been supplied from the company's Newark, N. J., works. The new plant gives increased facilities and permits prompter service in the supply of gases in cylinders.

About six years ago, the International company brought to America the rights to manufacture electrolytic gas generating apparatus under certain European patents. An oxygen-hydrogen generating plant was installed to demonstrate the efficiency of the apparatus and the high purity of the gases. The Newark factory has since been operated to capacity in supplying the demand for the

company's generators, which are made in both the unit and the bipolar types.

The manufacture of apparatus is the main business of the company, this feature of its work being concentrated at the Newark factory. The manufacture and distribution of gas in cylinders is a local and secondary feature. The Newark and College Point plants supply Greater New York and the adjoining industrial section of New Jersey. The plant at Verona, Pa., serves the Pittsburgh district.

Performance of a Sheriffs' Wheel

Richard Piepkorn, owner and chief engineer of the lake steamer GOGEBIC, recently forwarded to the Sheriffs Mfg. Co., Milwaukee, Wis., some interesting observations upon the performance of a propeller wheel installed on his vessel by the Sheriffs company. He states that GOGEBIC is making one-half mile an hour better time loaded and one mile an hour better time light with the new wheel, and with a saving of one-fourth ton of coal. Vibration throughout the ship also has ceased. Mr. Piepkorn points out the saving in fuel used, and the increased earnings made possible by the greater speed. With the old wheel when increasing the speed or when cleaning fires, the steam "would get away from the firemen." Now with the same crew, these operations are performed without difficulty. GOGEBIC swings a 12-foot diameter wheel.

Poppet-Valve Engines

The Nordberg Mfg. Co., Milwaukee, has issued a very interesting bulletin in which it describes the series of poppet-valve engines which it manufactures. This series includes full poppet, poppet uniflow and poppet corliss engines. This variety is valuable in assisting the builder to determine the type of engine best adapted to different classes of service and thus to insure high efficiency. The high-speed, full-poppet engines are recommended for ordinary non-condensing service. For condensing service, either the poppet uniflow or the poppet corliss is best adapted. The poppet uniflow has a uniflow cylinder design;

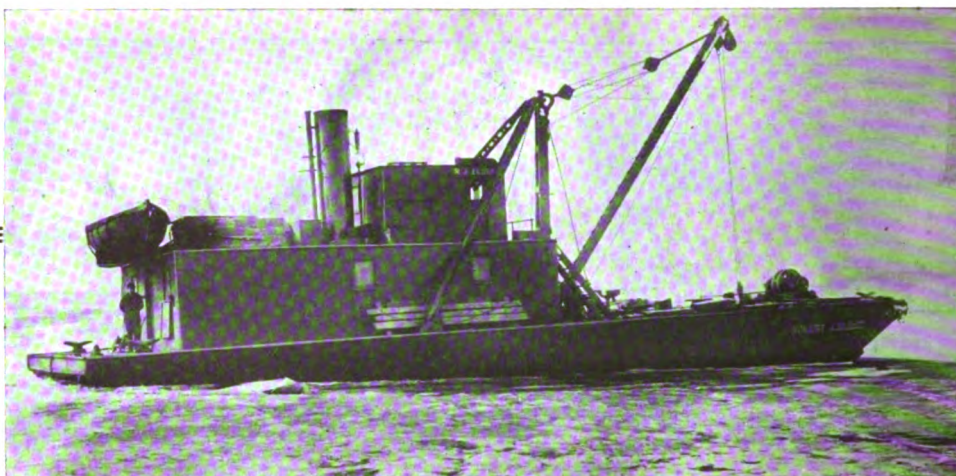
that is, it has exhaust ports in the cylinder barrel and poppet steam valves. The poppet corliss is a compound engine with a full poppet high pressure cylinder and a corliss valve low pressure cylinder. The poppet uniflow engine is said to be particularly adapted to widely fluctuating loads because of its flat steam consumption characteristic. The corliss type of poppet engine is recommended for service under constant load where it is said to show a high steam economy.

The bulletin is well illustrated and shows installations of engines as well as the details of construction of the valves, operating gears, and other parts. Particular attention is drawn to the construction of the head which contains all cored passages and ports, the cylinder proper being a simple cylindrical casting which is free to expand and contract with temperature changes. A number of pages are devoted to test results and discussions of the application of poppet engines to specific installations.

Describes Marine Engines

The Morris Machine Works, Baldwinsville, N. Y., builder of centrifugal pumps, steam engines and hydraulic dredges, has issued a catalog describing its various products. Information is given in regard to its vertical marine engines which will prove of value to ship owners and operators. The line of products includes simple and compound engines in sizes from 1½ to approximately 300 horsepower. The book also presents a complete discussion of the design and characteristics of Morris centrifugal pumps. Numerous illustrations show installations of this equipment. Sectional views also are shown in addition to curves of operating characteristics. Data are given for both horizontal and vertical pumps. These are both steam-driven and electric-driven types. Valuable information is given in regard to hydraulic dredging pumps and the work they may be expected to do under various conditions.

The Illinois Steel Co. has installed, in conjunction with whistle signal at its South Chicago plant, a flash light operated by electricity. The light is white and flashes every time the whistle blows. It is situated about 50 feet south of the red beacon light at the entrance to the north slip.



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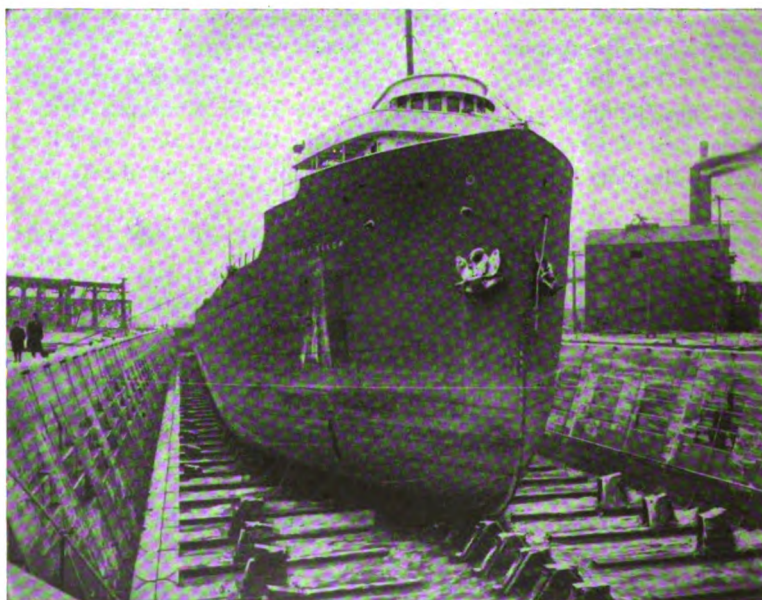
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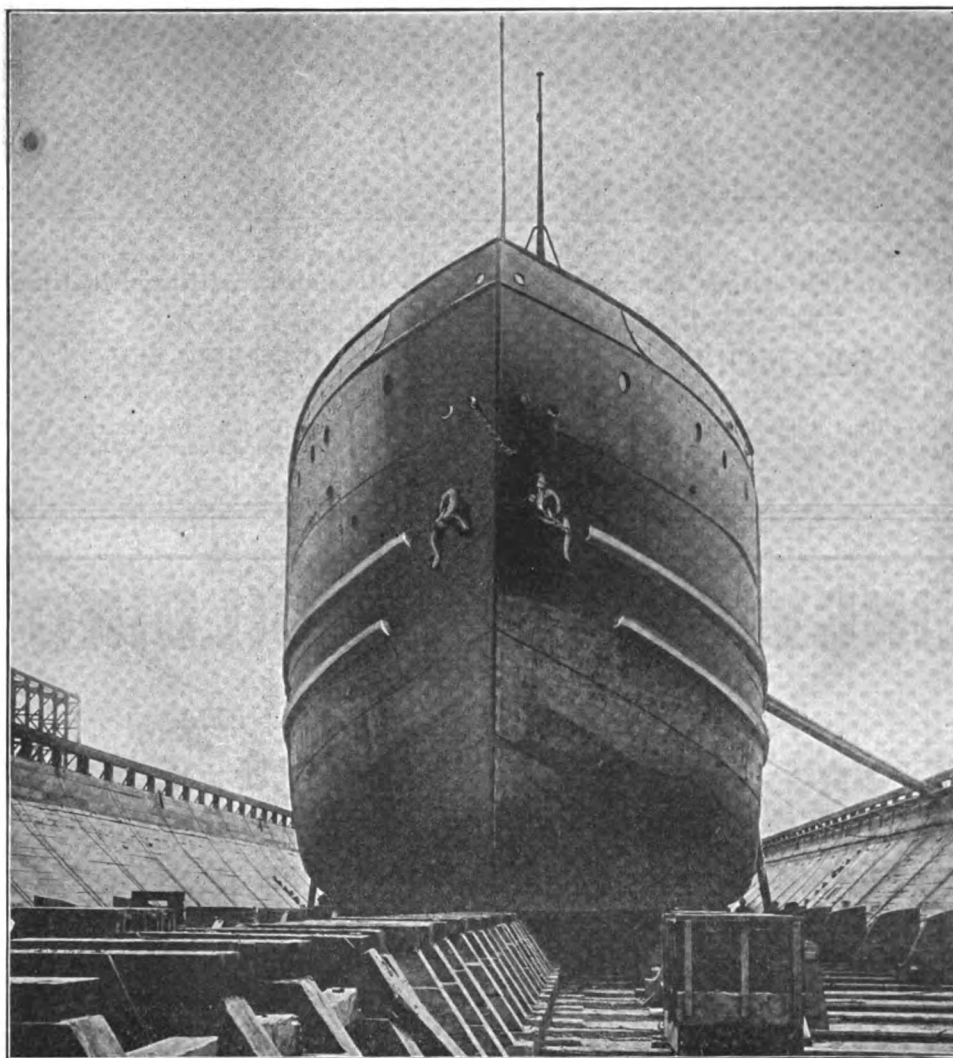
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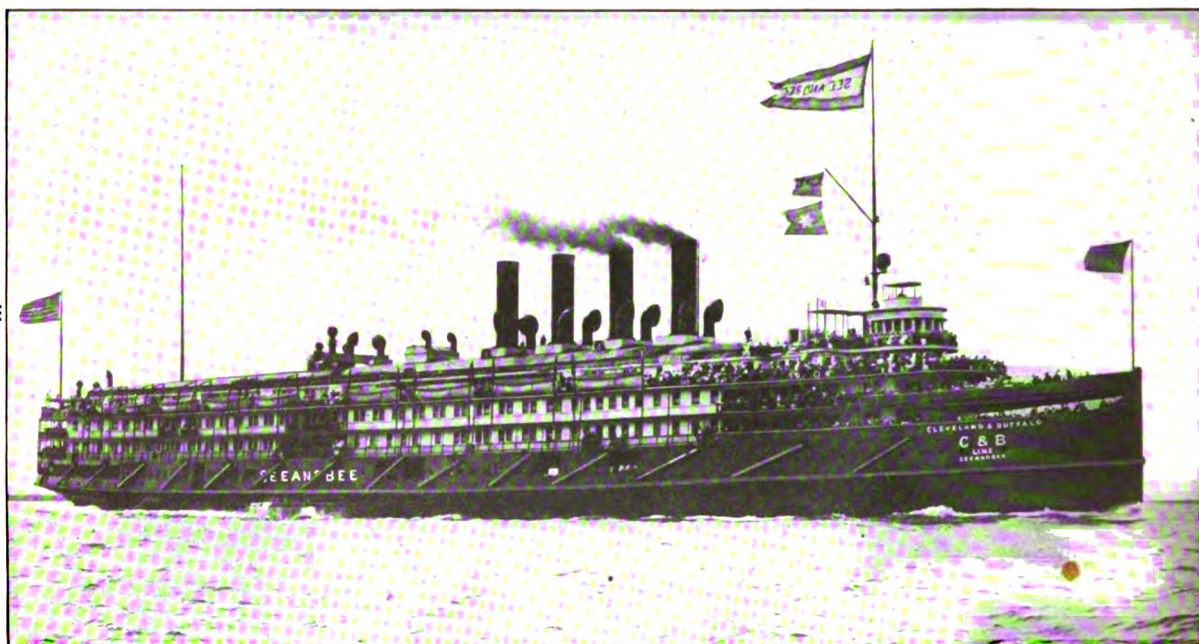
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EDWARD HOPKINS, Naval Architect

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BUILDERS OF "SEEANDBEE," LARGEST SIDE WHEEL STEAMER IN THE WORLD. Designers and builders of all types of
Freight and Passenger Steamers, Engines, Boilers and Auxiliary Machinery

Manufacturers of BRASS MARINE HARDWARE and BRASS SPECIALTIES.
 Builders of Metallic Life Boats and Clark Patent Metallic Life Rafts.

DETROIT SHIPBUILDING COMPANY

M. E. Farr, Pres. and Treas.

E. Ketcham, Secretary

Frank Jeffrey, Gen. Supt.
 Established 1852

John D. Langell, Supt. of Dry Docks and Repairs

Steel Shipbuilding Plant at Wyandotte, Michigan. First-class equipment for making hull and machinery repairs.

Dry Docks, Machinery Works and General Offices, Foot of Orleans Street

DETROIT, MICH.

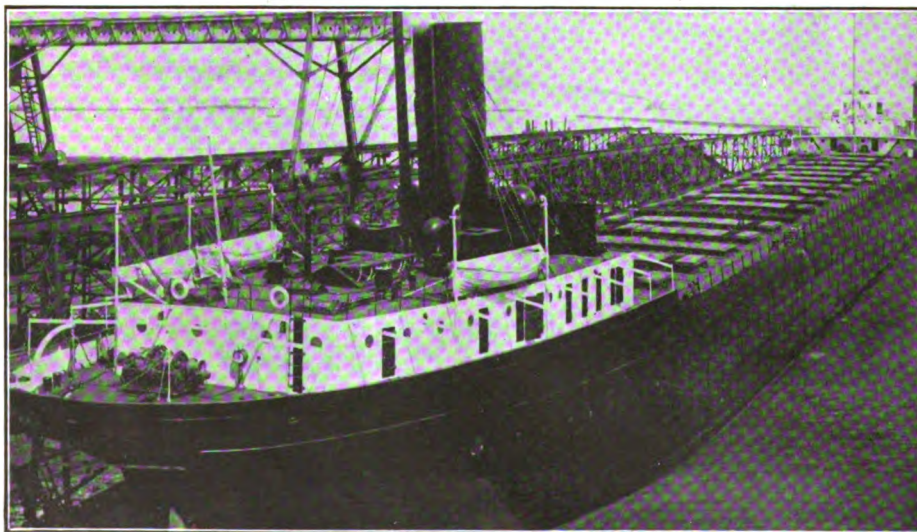
COLLINGWOOD SHIPBUILDING CO.

LIMITED

COLLINGWOOD—ONTARIO—CANADA

STEEL and WOODEN SHIPS, ENGINES, BOILERS, CASTINGS and FORGINGS

PLANT FITTED WITH MODERN APPLIANCES FOR QUICK WORK




Steamer "J. H. G. HAGARTY" Completed

**DRY DOCKS
 and
 SHOPS
 EQUIPPED TO
 OPERATE
 DAY or NIGHT
 on
 REPAIRS**

Please mention THE MARINE REVIEW when writing to Advertisers

“ISHERWOOD” SYSTEM OF SHIP BUILDING



Experience has proved that this system gives increased strength, increased cubic and deadweight capacity, reduced cost of maintenance, and reduced vibration at no greater first cost than a vessel of similar dimensions built on the transverse system.

Owners who are contemplating the construction of new vessels, of any type whatever, will find this system of construction most advantageous and suitable for all trades.

580 vessels of all types and sizes, representing about 4,466,000 tons deadweight carrying capacity have been built or are now on order, including a good many repeat orders from owners who have tried the system.

**J. W. ISHERWOOD,
17 Battery Place
NEW YORK CITY**

Head Office, 4 Lloyd's Avenue
LONDON, E. C.

Tel. Number:
6838 Rector

Please mention THE MARINE REVIEW when writing to Advertisers

Ours is not the ordinary kind of dry dock. **One** of the distinct advantages that we have over others is the **marine railway**, which is 500 feet in length. This railway allows us to haul out craft and move them around so that we can take advantage of our 5 acres of property, thus giving us an immense capacity. We employ a force of 75 men who have at their disposal every modern convenience, including a complete mill for getting out material; a large up-to-the-minute electric derrick; a great number of electric drills, etc. One of the boats on which we are now working, is the fuel lighter, Wm. G. Perry, owned by the Pittsburgh Coal Co., length 175 feet; beam 34 feet.

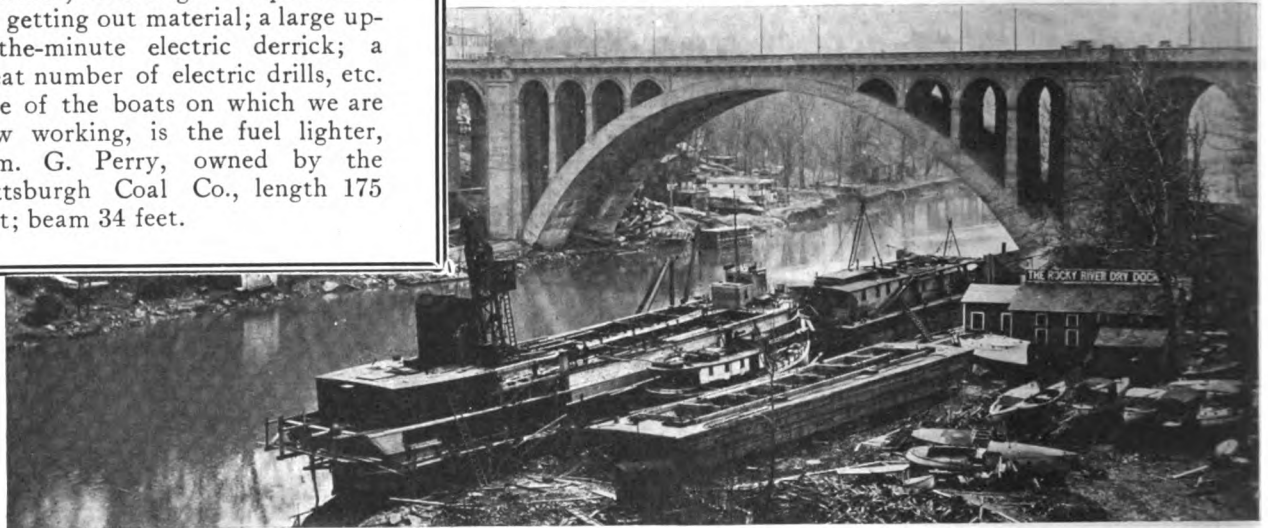
A New, Complete Dry Dock at Your Service!

We Build, Rebuild and Repair
anything that floats, up to 200 feet in length, and with
draft not exceeding 12 feet.

We specialize
Large and small **Vessels, Tugs, Power Boats and Yachts.**

Put your proposition up to us and you will not be disappointed.

ROCKY RIVER DRY DOCK COMPANY
ROCKY RIVER - - - OHIO



Tietjen & Lang Dry Dock Co.

HOBOKEN, N. J.

**NINE
DRY DOCKS**

General Repairs on Wooden and Iron Vessels

FT. OF 17th STREET

Telephone 700 Hoboken

HOBOKEN, N. J.

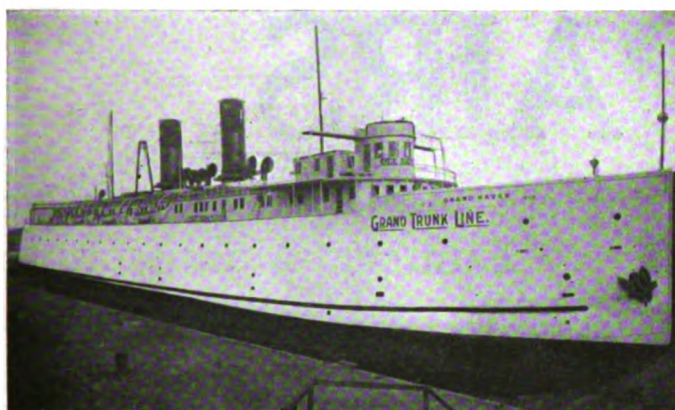
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Milwaukee Dry Dock Company

Milwaukee, Wisconsin

Ship Repairs of All Kinds

Also Machine Shop for Engine Repairs



Car Ferry "Grand Haven" in Dry Dock

We have two ship yards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 feet long on keel blocks; 460 feet over all; 60 feet width of gate and 16 feet over sill. West Yard Dock is 312 feet on keel blocks; 45 feet width of gate and 12 feet over sill. Rudder pit in each dock. Electric light for night work.

Residence Phone
F. W. Smith, Manager
Lake 467

Main Office at South Yard
Foot of Washington Street

Telephone—Hanover 3
West Yard—Hanover 2555



The Buffalo Dry Dock Company

BUFFALO, N. Y.

With our excellent equipment we are enabled to do all kinds of ship repairs at reasonable cost to the owners, whose patronage is solicited with the guarantee of satisfaction in all particulars.

EDWARD N. SMITH, Superintendent

WILLIAM KNIGHT, Ass't Sec'y and Treas.

Office Telephone, Bell, 4055 Seneca: Federal, 22-531

Superintendent's Telephone, Tupper 3012

Ass't Sec'y's Telephone, 324 North

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LARGEST FLOATING DRY DOCK EQUIPMENT ON THE PACIFIC COAST

Completely Equipped Shops for Ship, Engine and Boiler

REPAIRS

Ship Builders, Engine Builders, Boiler Makers, Iron Founders, Brass Founders, Lumber Manufacturers

PARSON'S MARINE STEAM TURBINES—YARROW BOILERS

Cable Address: "THREEDOCKS"—Codes: Western Union, A. B. C., 5th ed. and Bentley's

Seattle Construction & Dry Dock Company
SEATTLE, WASHINGTON

Manitowoc Shipbuilding Co.

Designers and Builders of

Steel Passenger Boats
Steel Freighters
Sand Suckers
Dredges

Floating Cranes
Lighters
Fireboats
Tugs
Dump Scows

Marine Engines
Semi Diesel Engines
Marine Boilers
Deck Machinery, etc.

Facilities for prompt and economical repairs

MANITOWOC - WISCONSIN

BATH IRON WORKS

LIMITED

BATH, MAINE

Shipbuilders and Engineers

Licensee for
Parson's Marine Turbines,
Normand Express Water Tube Boilers.

Particular Attention Given to
High Speed Requirements
Estimates Furnished.

Please mention THE MARINE REVIEW when writing to Advertisers

OUR DRY DOCKS SAVE TIME

Two Docks, coupled with Complete Shop Facilities, cut repair periods to a minimum

	Upper Dock	Lower Dock
Length on Keel Blocks, feet	600	437
Width of Dock Floor, feet	62	50
Draft Over Sill at Low Water	22½	22½

A COMPLETE SHIP BUILDING PLANT

Our new building slips take vessels up to 325 feet long, 50 feet beam and 32 feet deep. Our yard is specially laid out for rapid construction. We also have auxiliary building slips for small craft.

**Baltimore Dry Docks and
Shipbuilding Company**

BALTIMORE, MD.

CABLE ADDRESS - BALTODOCKS, U. S. A.

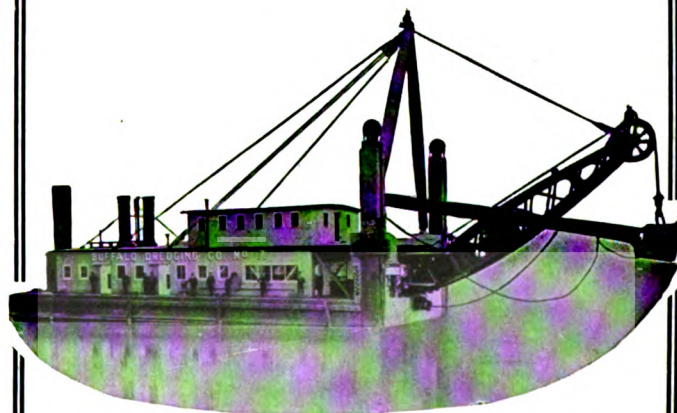


**Moore and Scott
Iron Works**

Engineers and Ship Builders

SAN FRANCISCO, CAL.

**MODERN MARINE BOILERS
and
STEEL SHIP BUILDING**



**TUGS, PASSENGER STEAMERS
and SPECIAL CONSTRUCTION**

WRITE

JOHNSTON BROTHERS

FERRYSBURG, MICHIGAN

Please mention THE MARINE REVIEW when writing to Advertisers

H. R. GARY, MANAGER

CABLE ADDRESS:
"CUMSHIP", W. U. CODE**CUMMINGS SHIP INSTRUMENT WORKS**

110 HIGH STREET, BOSTON, U. S. A.

July 11, 1916.

The Marine Review,
Cleveland, Ohio.

Gentlemen:-

We have just received your suggested advertisements for the August, September and October issues of the Marine Review. They are all so good that there isn't much choice in selecting the one to run in your magazine. We are much pleased with your copy service and find it a great help as well as a time saver to a firm without an advertising manager such as we are. Your suggestions for advertisements are put up so attractively and sparkle with such striking phrases that we do not call on any other publication in which we advertise for this service but rely on the Marine Review solely.

Very truly yours,

CUMMINGS SHIP INSTRUMENT WORKS.



Manager.

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WATERBURY CORDAGE



For All Marine Uses In All Standard Grades

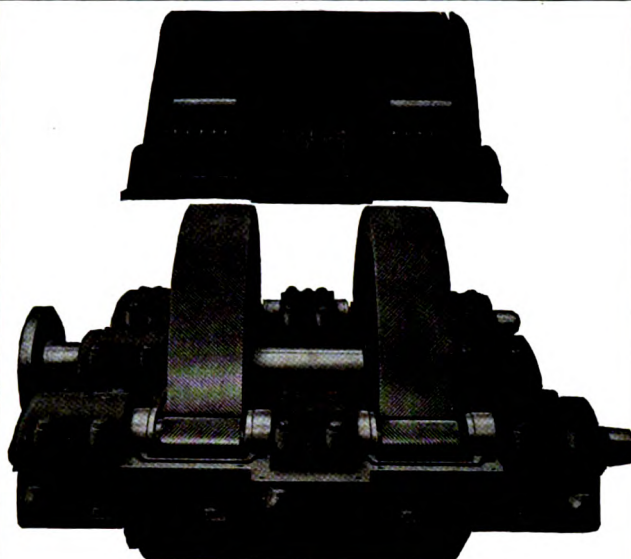
Years of experience in rope making insures the very highest quality in respective grades.

Write to our nearest office for prices and deliveries on Waterbury Cordage. Also Waterbury "Green Strand," "Armored" and "Fibreclad" Wire Rope.



WATERBURY COMPANY
63 PARK ROW, NEW YORK

CHICAGO.....419 W. 12th Place
DALLAS, TEX., Powell & Ellet Co., 911 Southwestern Life Bldg.
SAN FRANCISCO.....113 Davis St.
NEW ORLEANS.....1018 Maison Blanche Bldg.



4500 H. P. De Laval Marine Reduction Gear

Use DE LAVAL Geared Marine Steam Turbines

The double-helical speed-reducing gear for steam turbine service was first introduced by De Laval in 1894.

At present over 6500 De Laval Double-helical Speed-Reducing Gears are in successful operation.

De Laval Gears are built by highly skilled workmen from the best materials, and with equipment developed and improved by over 20 years of experience.

All factors entering into the design have been chosen after long experience under practical operating conditions, and all parts are made on a limit gage, interchangeable basis.

The De Laval Double-helical Speed-reducing Gear is not an ingenious idea based upon imperfectly developed theories, but an accomplished fact.

It is based upon the principle that a correctly cut gear, correctly mounted and protected from external distorting forces, will run smoothly and noiselessly and will not be subject to excessive wear or deterioration.

If interested in saving weight and fuel, and in the greater simplicity and lower first cost of geared turbines for ship propulsion, write us, giving particulars of the proposed boat so that we may supply full information.

We are prepared to furnish marine steam turbines and gears in any capacity and for any steam conditions.

DE LAVAL
Steam Turbine Co.
TRENTON, N. J.

219

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FIRE TUBE MARINE SUPERHEATER

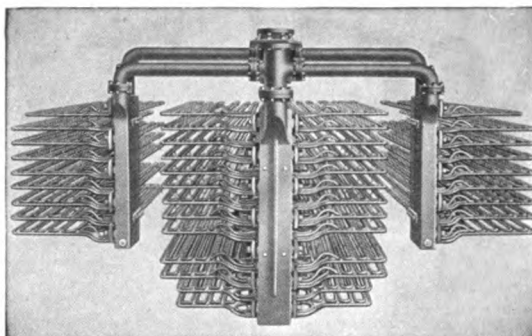
EIGHT REASONS WHY

1. It is adaptable to either new or existing boilers of the fire tube type and can be applied with no change in design or construction.

2. It renders possible an increase in output of boiler horse power from a given boiler plant, 10% to 20%.

3. It will produce the same power output with fewer boilers.

4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.

6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges and condensation in the cylinders.

7. It does not prevent rapid, thorough and frequent cleaning of the tubes.

8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, NEW YORK, N. Y.

Peoples Gas Bldg., CHICAGO, ILL.



"Known throughout the Maritime World."

The McNab Direction Indicators

(Gold Medal and Diploma Awards) indicate every movement and record the engine revolutions on the bridge. Thousands installed and specified for installation on 90% of steam vessels building in this country.

NO STEAMER COMPLETE WITHOUT IT.

The Willett-Bruce S. S. Whistle Control

The only control adopted by all Transatlantic and other Lines, large number of installations on order and installed in this country.

An automatic fog signal assured, and a dry, clear, crisp, penetrating blast guaranteed.

The McNab Pneumatic Engine Counter

Connect it up by a pipe and install it on your steam gauge board, do away with your constant clattering rods and small gear; it is a "revolution in counters."

The McNab "Cascade" Boiler Circulator and Fuel Economizer

Hundreds installed, a practical Circulator that does circulate and economize.

Write for a full set of our books.

THE McNAB COMPANY, Bridgeport, Conn.

or

EDW. P. FARLEY, 1501 Railway Exchange Bldg., Chicago, Ill.
D. E. FORD, 465 California St., San Francisco, Cal.
M. M. DRAKE, 17 Battery Place, N. Y. City.

Eckliff Boiler Circulators

"Watch
the
Thermometer"

¶ If your Scotch Boilers are Eckliff-equipped, they're hot at the bottom and steaming at highest efficiency.

¶ If they are not Eckliff-equipped, they're not hot at the bottom and are not steaming at highest efficiency.

¶ Why not put your boilers in the Highest Efficiency class?

¶ Eckliff results are proved results—and they're guaranteed.

GET THE BOOKLET

ECKLIFF AUTOMATIC BOILER CIRCULATOR CO.

DETROIT

54 Shelby Street

MICHIGAN

Have You Read the Classified Advertisements?

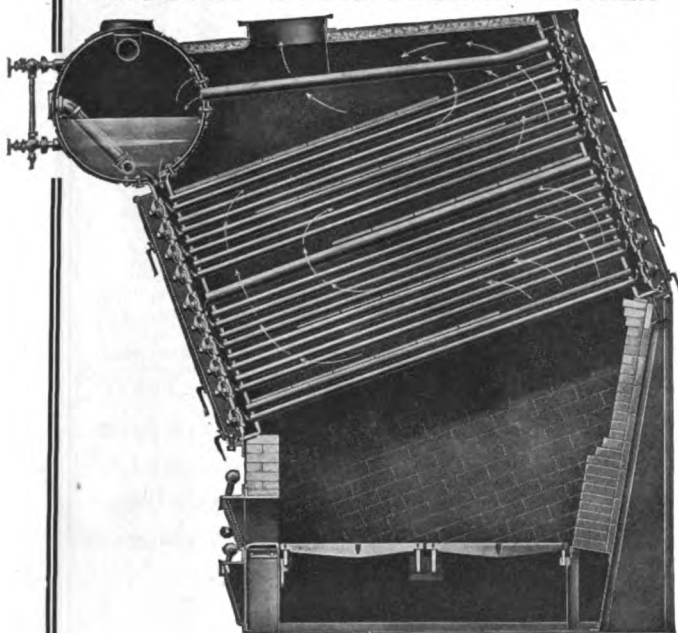
Real bargains in Passenger and Freight Boats, Dredges, Tugs, Dredging Machinery, Engines, Boilers, Cranes, and other opportunities are awaiting you.

Take a Look Now—You May Find Something Interesting

202

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WARD'S WROUGHT STEEL MARINE BOILER



ADOPTED BY U. S. GOVERNMENT

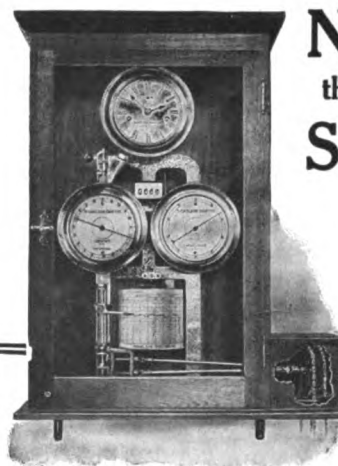
GENERATING TUBES EXPANDED. NO OTHER JOINTS. NO NIPPLE CONNECTIONS. NO STAYBOLTS.

The Charles Ward Engineering Works
CHARLESTON, WEST VIRGINIA
MARINE ENGINES RIVER STEAMERS

NICHOLSON

the most advanced type of

SHIP LOG



Gives the mileage sailed, and shows the exact speed per hour on a dial, recording it on a chart for every minute of the trip.

The Nicholson Recording Ship Log is installed on battle ships, passenger ships, bulk freighters, car ferries, yachts, and motor boats.

Write for catalogue

NICHOLSON SHIP LOG CO.
Cleveland, O.



Holding the Records in the Navies of the World

The records for Economy, Capacity and Endurance in the Navies of the World, are held by

BABCOCK & WILCOX FORGED STEEL Marine Water-Tube Boilers and Superheaters

Moreover, the same superior characteristics have been proved in the Merchant Marine.

Do you know that Babcock & Wilcox Boilers and Superheaters in one vessel are saving more than 15 per cent over Scotch boilers in sister vessels?

Isn't such a great reduction in coal bills of very great interest to you?

All essential parts of Babcock & Wilcox Boilers are heavier than the corresponding parts in Scotch boilers, thus giving greater security against corrosion.

Let us send you full details explaining why "Babcock & Wilcox" stands for safety, ease of cleaning and simplicity of operation.

A large portion of our business consists of "repeat-orders." You know what that means. *Write us at once.*

The Babcock & Wilcox Co.
NEW YORK and LONDON

When You Buy DIXON'S The Pioneer BOILER GRAPHITE



You not only get a remedy for boiler scale but you get the benefit of

THE DIXON NAME which for eighty-nine years has been the international leader in the production of Graphite.

THE DIXON EXPERIENCE which covers the entire history of the application of graphite for every conceivable purpose.

THE DIXON REPUTATION which has been built by selling the right graphite for the right purpose.

DIXON'S (The Pioneer) BOILER GRAPHITE saves a lot of money in the cost of cleaning boilers.

Booklet No. 77 T tells HOW and WHY the FLAKE GRAPHITE is superior.

Send for it.

Made in JERSEY CITY, N. J., by the
Joseph Dixon Crucible Co.

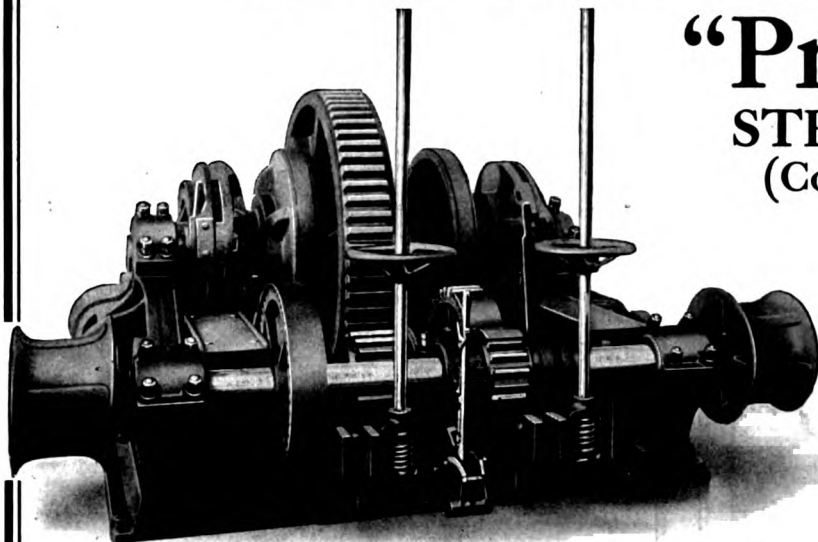
Established 1827

T-21

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"Having a PULL means having a friend in power who will act as a steam windlass for you." The

"Providence" STEAM WINDLASS (Compound Spur Gears)



has another kind of *pull*, and plenty of it. It has 15 per cent more *pull* than the worm geared types and at 50 per cent faster speed. You have been looking for just this combination. Our price will please you, too.

Write us today.

AMERICAN ENGINEERING COMPANY

SUCCESSORS TO AMERICAN SHIP WINDLASS CO. AND WILLIAMSON BROS. CO.

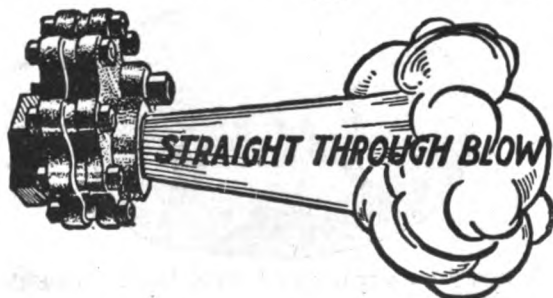
MACHINISTS AND FOUNDERS

PHILADELPHIA

15-312

Blow Off Troubles Disappear
when each Boiler is equipped with

Everlasting Blow Off Valves....



No more heat waste past the blow offs.

No repairing for years.

Note the straight through blow.

There is no chance for clogging.

Self cleaning and self grinding.

Will pass government inspection for
250 pound steam pressure.

GUARANTEED drop tight for two
years or money refunded.

Get Our Free Trial Proposition

Scully Steel & Iron Co.

Chicago

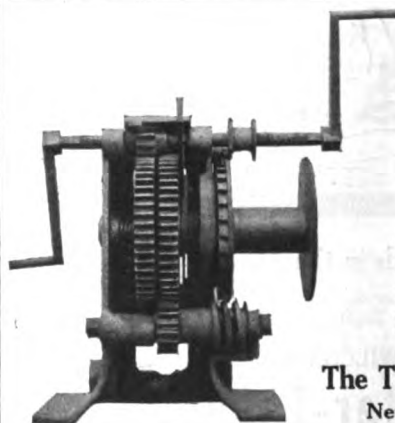
New York

IRVINE Boat Handlers

Cheap to Install

**Adapted to Either
New or Old Work**

We have 11 Sets in A 1
condition we will sell
cheap. These machines
will handle easily a boat
of 280 cu. ft. capacity.



The T. A. Scott Co., Inc.
New London, Conn.

**STEAM STEERING ENGINES
CAPSTANS
WINDLASSES
MOORING HOISTS
DRILL HOISTS
SPUD HOISTS, ETC.**

Write for new catalog just out



DAKE ENGINE CO.

Grand Haven, Mich.

New York Agent: Charles H. Hughes

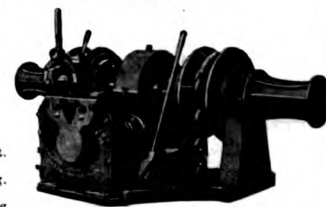
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Chicago Agent: J. E. Chisholm,

1410 Fisher Bldg.

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1070 Penobscot Bldg



Please mention THE MARINE REVIEW when writing to Advertisers



Stevedoring Profits Greatly Increased Using G-E Portable Control Gear

Maximum dispatch, reduced cost, greater safety and lessened damages follow the use of winches equipped with G-E motors and portable controller, the latter hung over operator's shoulders.

Operator moves about following draft and controlling winches with a muff like controller—with electricity he does all the work usually done by two winchmen, one or two signalmen and two steam engines.

Maximum Dispatch

G-E equipment is always ready for instant use—no "standby" charges, overhaul bills or time lost getting old gear into working order.

Walking after and seeing his draft at all times the operator works very much faster than when depending upon uncertain signals—electricity relieves him of all physical fatigue usually occasioned by handling clumsy throttles, foot brakes and heavy reverse mechanisms.

Speed is not limited by boiler capacity as operator usually has big city power plant to back him up.

Quicker turn round for vessels and increased prestige to the Port follow the use of G-E electrical equipment for burtoning.

Reduced Cost

Time is saved by winches being ever ready for work, men work faster knowing operator sees them, one man does the work of three or four, when hoist is still there is no power consumption, greatly increased dispatch reduces "overhead" charges and labor bill and the practical elimination of accidents and damage to properties or cargo, all combine to reduce cost.

Greater Safety

The operator's eye is always on the business end of whips as he follows draft about and his co-workers are always in sight. All accelerating, speed setting, braking, reversing and stopping is done automatically, since the operator merely starts each operation which is always performed at the same rate of speed by electricity. For instance, the operator turns a handle to start hoisting; he can turn it as fast as he wishes but the hoisting will not be done any faster than the electrical control permits. If he wishes, a very slow speed can be obtained, but the uniform rate enables co-workers and operator to judge movements accurately.

Lessened Damages

With draft always in sight and moving at a uniform speed, or uniformly accelerated speed, and with braking constant, damage to properties or cargo is inexcusable and leakers or poorly assembled drafts can be put down before loss occurs.

Your inquiry is solicited

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio

Cleveland, Ohio
Columbus, Oh.
Dayton, Ohio
Denver, Colo.
Des Moines, Iowa
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Fort Wayne, Ind.
Hartford, Conn.
Indianapolis, Ind.

General Office: Schenectady, N. Y.

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Joplin, Mo.
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New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.

St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

For Michigan business refer to General Electric Company of Michigan, Detroit.
For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company, (formerly Hobson Electric Co.), Dallas, El Paso,
Houston and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

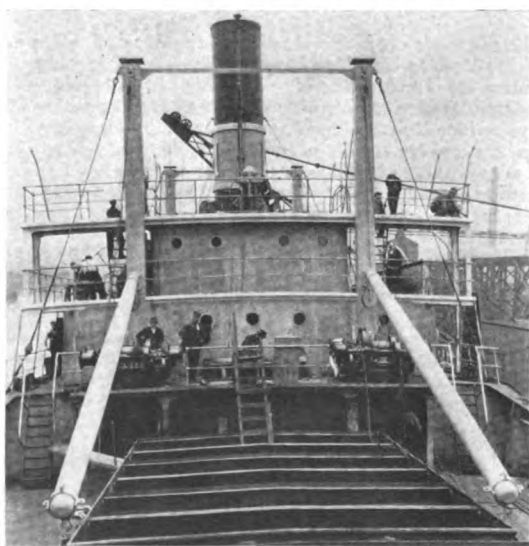
6318

Please mention THE MARINE REVIEW when writing to Advertisers



Steel Ships for Ocean Service

The good ships JOHAN MJELDE and GIJONES lifted anchor within the past month and sailed from the yards of the American Ship Building Company at Cleveland for far away Norway. Also the GISLA and GAUTE have sailed from our yards at Detroit and NORDAL from south Chicago, these to be followed shortly by the VESTLAND from Detroit. These six ships for Norwegian service are built to Lloyd's rules for ocean service and will carry approximately 3200 gross tons deadweight.



Bow of Norwegian steamer built on the Great Lakes showing part of cargo handling equipment.

Five large plants with the most modern equipment insure rapid construction

Our five complete shipbuilding plants located at Cleveland, Lorain, Detroit, South Chicago and Superior, Wis., are fully equipped to build vessels of any class for lake, ocean, sound or river service, and in addition our plants at Buffalo and Milwaukee have every facility for promptly handling repair work.

We also furnish and install all kinds of marine and stationary engines, boilers, windlasses and auxiliary machinery.

The American Ship Building Company

CLEVELAND, OHIO

M. E. FARR, President

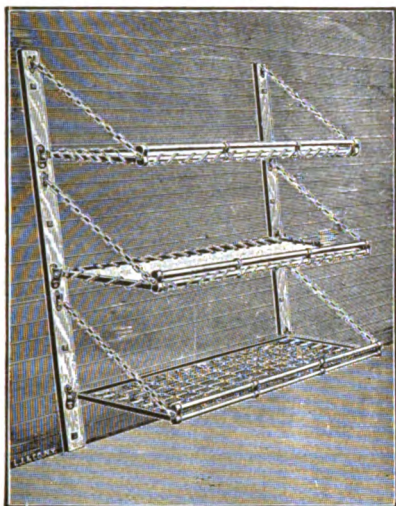
O. J. FISH, Vice-President

A. G. Smith, General Manager

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The Southern - Rome Company

BALTIMORE, MD.



No. 1 ROMELINK BERTH (Open)
MANUFACTURERS OF

**Metal Berths and Bunks
of Every Description**

Illustrated Catalog upon request

SOUTHERN-ROME COMPANY

623-633 West Pratt St.
BALTIMORE, MD.



THE ACCEPTED MODEL of UNCLE SAM

¶ The battleships Oklahoma, New York, California, Delaware, Texas, Arizona, Pennsylvania and Idaho as well as a number of destroyers are equipped with

PROVABLE FACTS—

IF you want to experiment—you won't be interested in the WAGER PATENT IMPROVED FURNACE BRIDGE WALL. BUT if you want a bridge wall that has in it five years of making good; a bridge wall that is turning the marine industry away from the antiquated fire brick; one that insures less smoke, minimum upkeep, greater efficiency and backed up by responsible references including all the leading railroad, freight and passenger steamer companies, private yacht owners, stationary plants and others—you WILL be interested in the WAGER BRIDGE.

This isn't argument, or persuasion, or contention. It's just simple, provable facts. May we prove these facts to you?

ROBERT H. WAGER

FURNACE BRIDGE WALLS

New York

Philadelphia

Detroit

New York Office: Singer Building

Telephone: Cortlandt 4299



ELECTRIC WHISTLE OPERATOR

The simplicity of installation is one of the many advantages over all other electrically controlled Whistle Valves, saves time, material, weight, maintenance and cost.

Eliminating instruments and wiring in wheelhouse.

Eliminating the use of Electric Motors for operating.

Electric Control Co.

161 Washington St.
NEW YORK

DYSON PROPELLERS

These propellers, as the name implies, are designed by Captain Chas. W. Dyson, U. S. Navy, and are made under his personal supervision.

They carry the features of efficiency guaranteed by the reputation of Capt. Dyson, who is a recognized authority on the subject of screw propulsion.

Eliminate the waste of propulsive power by installing DYSON PROPELLERS.

Catalog upon application

**AMERICAN MANGANESE
BRONZE CO.**

Holmesburg

Pa.

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**ALBERT J. GILCHRIST**

PROCTOR IN ADMIRALTY

Rockefeller Building

CLEVELAND, O.

C. E. KREMER,COUNSELOR AT LAW AND
PROCTOR IN ADMIRALTY

Suite 1012-1016 Insurance Exchange Building

CHICAGO, ILL.

GOULDER, WHITE AND GARRY

LAW OFFICES

Rockefeller Building

CLEVELAND, O.

Walter I. Lillie

Leo C. Lillie

Hugh E. Lillie

LILLIE, LILLIE & LILLIE
LAWYERSProctors in Admiralty, General Practitioners
and Commercial Collections

Business Address, GRAND HAVEN, MICHIGAN

S. H. HOLDING, F. S. MASTEN, T. H. DUNCAN and F. L. LECKIE

**HOLDING, MASTEN, DUNCAN
& LECKIE**ATTORNEYS AT LAW AND
PROCTORS IN ADMIRALTY

840-848 Rockefeller Building

CLEVELAND, O.

Spencer & Spencer

ATTORNEYS AT LAW

PROCTORS IN ADMIRALTY

Alworth Building, Duluth, Minn.

**HOYT, DUSTIN, KELLEY,
McKEEHAN & ANDREWS,**

LAWYERS AND PROCTORS IN ADMIRALTY

Offices, 702 Western Reserve Bldg.,

CLEVELAND, O.

WARREN, CADY, LADD & HILLATTORNEYS AT LAW AND PROCTORS
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Proctors in Admiralty

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Michigan

Each of the ads on this page is a seed planted in a large circle of vessel owners. It grows by repetition until it bears the fruit of business.

323

Do you handle Admiralty cases?

Yes?

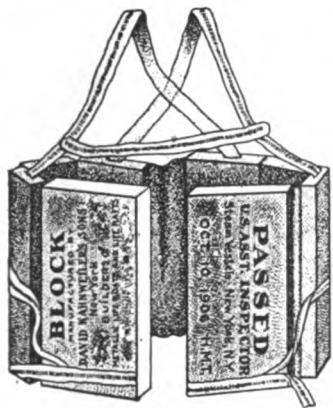
Why not do a little shouting—you can handle more? You have a vast field of prospects, BUT, what are you doing to introduce yourself to them?

322

This page of Admiralty Proctor's cards is a directory for the vessel owner or operator. You can have your card in this directory at a surprisingly low cost.

321

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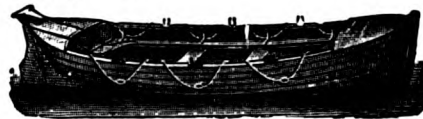


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It is now made in sections of any desired length. The sections can be instantly connected by means of snap hooks, adapting the ladder to light or loaded conditions of ships and eliminating the telescopic feature of the former type.

The cable is of plow steel combining lightness with great strength; the steps stamped sheet metal with two-tooth prongs giving a firm foothold; hooks bronze and rivets copper.

The ladder can be compactly rolled up for storage.

"We beg to advise that the Jacob's Ladder furnished the steamer Castalia during season 1913 has proven very satisfactory indeed. The master, Capt. W. L. Girardin, reports that these ladders should be installed on all the boats as they are very efficient and much safer than the old style roper ladder."

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McArthur Portable Fire Escape Co.
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The McArthur Jacob's Ladder is patented and all infringements upon it will be prosecuted



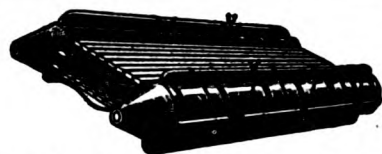
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THE MARINE REVIEW

Cleveland, Ohio

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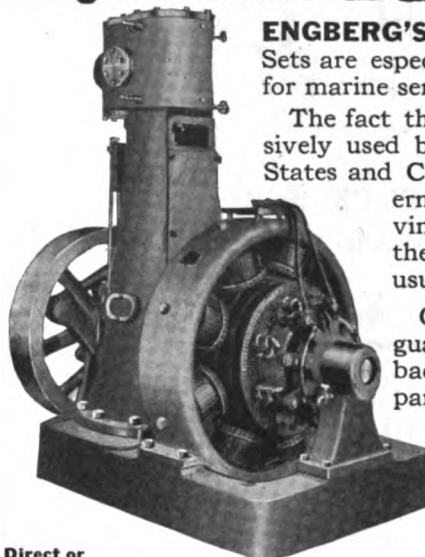
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Installations

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The fact they are extensively used by the United States and Canadian Governments is convincing proof they possess unusual merit.

Our iron clad guarantee stands back of each apparatus.

Bulletins fully describing this equipment sent upon request.

Direct or Alternating Current—1 to 75 KW

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You Can't Sink!

—if supported by a
**Universal Ilanasilk
Life Preserver**

Reliable Life Saving Equipment

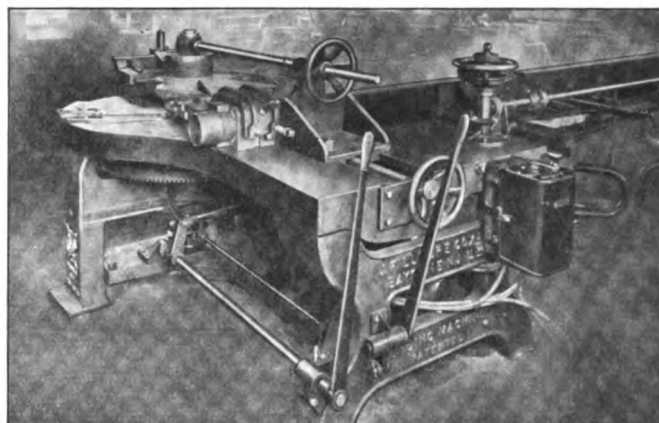
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Universal Ilanasilk Life Preservers, Cushions, Mattresses, Ring-buoys, etc., are **age-proof, decay-proof, puncture-proof** and **water-proof**—and will float the heaviest person **forever**.

Sold by reliable dealers.
Write for particulars and prices.

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INSTALLED BY RUSSIAN ADMIRALTY,
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Better & Cheaper Bends
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Manufacturer of

Diving



Apparatus

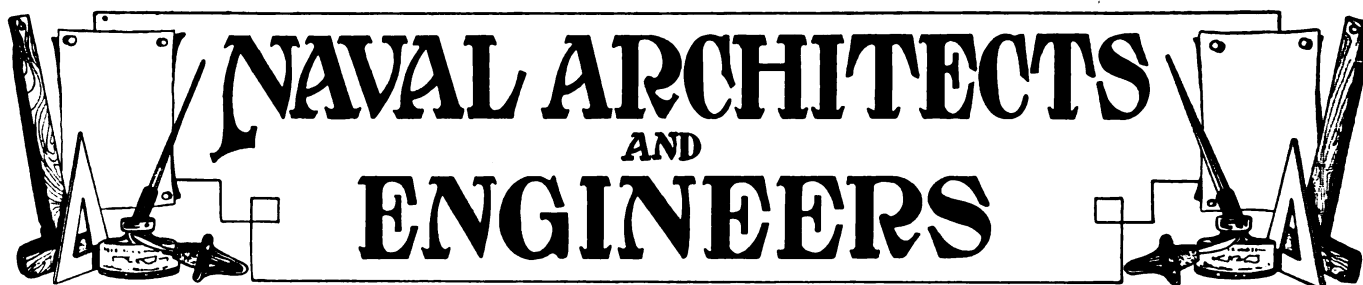


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You need this service—let's start something for you in the next issue.

Write today for rates.

THE MARINE REVIEW

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Look Best and Last Longest.
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Some kinds give service
for but a **short time**.
These, regardless of
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"N. B. O." is unequalled as a joint packing,
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We'll be glad to send you a sample piece large
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MANUFACTURERS OF

Low Pressure

REFRIGERATING MACHINES

Marine Work a Specialty

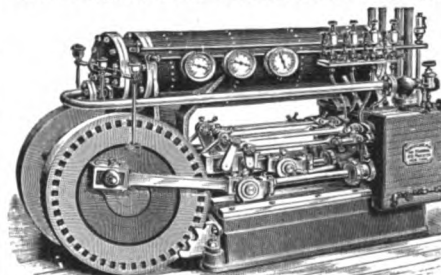
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Sullivan, D. & Co., Chicago, Ill.
Vance & Joys Co., Milwaukee, Wis.

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Donnelly, Wm. T., New York, N. Y.
Farley, Edward P., Co., Chicago, Ill.
Furstenau, M. C., Philadelphia, Pa.
Ried, John, & Co., New York, N. Y.

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Hoyt, Dustin, Kelley, McKeehan & Andrews, Cleveland, O.

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Spencer & Spencer, Duluth, Mich.
Warren, Cady & Ladd, & Hill, Detroit, Mich.

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Continental Iron Works, The, Brooklyn, N. Y.

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Continental Iron Works, The, Brooklyn, N. Y.

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Babcock & Wilcox Co., New York, N. Y.
Bath Iron Works, Bath, Me.

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Commercial Boiler Works, The, Seattle, Wash.

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Charleston, W. Va.

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Long Island City, N. Y.

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McNab Co., Bridgeport, Conn.

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Hanna, M. A., & Co., Cleveland, O.

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Pittsburgh Coal Co., Pittsburgh, Pa.

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American Engineering Co., Philadelphia, Pa.

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(Electric Boat.)
American Engineering Co., Philadelphia, Pa.

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American Engineering Co., Philadelphia, Pa.

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Armstrong Mfg. Co., Bridgeport, Conn.

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Superior Iron Works, Superior, Wis.

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Curr, Robert, Port Arthur, Ont., Can.

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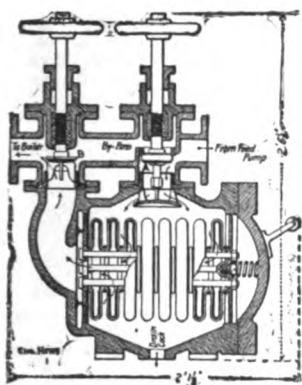
Armstrong Mfg. Co., Bridgeport, Conn.

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They Have No Equal

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Guaranteed to give Unequalled Efficiency, Durability
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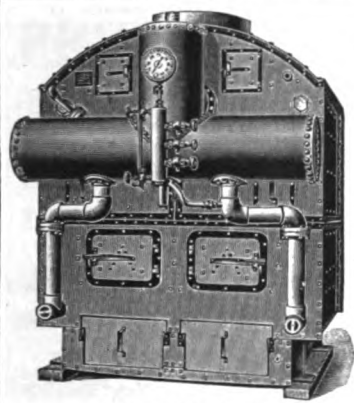
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Specify the Ashton and Get the Best

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Branches: New York Chicago Philadelphia San Francisco

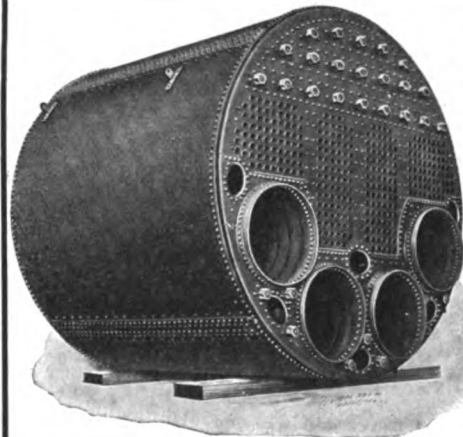


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Builders of
Sectional Water
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vessels

**Providence, R. I.
U. S. A.**



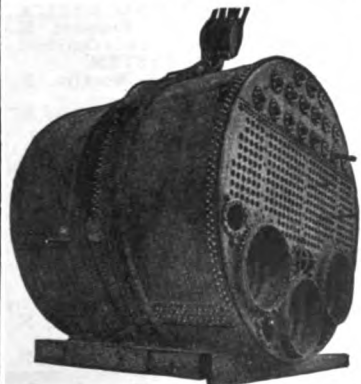
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Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Rocky River Dry Dock Co., Rocky River, O.
Seattle Construction & Dry Dock Co., Seattle, Wash.

Superior Ship Building Co., Superior, Wis.
Tietjen and Lang Dry Dock Co., Hoboken, N. J.
Toledo Ship Building Co., Toledo, O.

DYNAMOS.
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EJECTORS.
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Electric Control Co., New York City, N. Y.

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Patterson-Sargent Co., Cleveland, O.

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American Ship Building Co., Cleveland, O.
Chase Machine Co., Cleveland, O.
Seattle Construction & Dry Dock Co., Seattle.
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(Hoisting.)
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Chase Machine Co., Cleveland, O.
Superior Iron Works, Superior, Wis.

ENGINES.
(Marine.)

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Bath Iron Works, Bath, Me.
Chase Machine Co., Cleveland, O.
Chicago Ship Bldg. Co., So. Chicago, Ill.
Collingwood Ship Building Co., Ltd., Collingwood, Ont., Can.

Detroit Ship Building Co., Detroit, Mich.
Fletcher, W. A., Co., Hoboken, N. J.
Fore River Ship Bldg. Corp., Quincy, Mass.
Johnston Bros., Ferrysburg, Mich.
Manitowoc Ship Building Co., Manitowoc, Wis.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Superior Ship Building Co., Superior, Wis.

Toledo Ship Building Co., Toledo, O.
Trout, H. G., Co., Buffalo, N. Y.
Ward, Chas., Engrg. Co., Charleston, W. Va.

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(Mooring.)

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Chase Machine Co., Cleveland, O.

ENGINES.
(Steering.)

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(Hatch.)

Mulholland Hatch-Fastener Co., Cleveland, O.

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(Feed Water.)
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Ross Valve Mfg. Co., Troy, N. Y.
Williams, Wm. E., New York, N. Y.

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Cory, Chas., & Sons, New York, N. Y.

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Williams, Wm. E., New York, N. Y.
GAGES.
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GRAPHITE.
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HOISTS.
(Anchor.)

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(Cargo, Etc.)

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Dake Engine Co., Grand Haven, Mich.
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(Electric.)

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General Electric Co., Schenectady, N. Y.

HOISTS.
(Pneumatic.)
Dake Engine Co., Grand Haven, Mich.

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Williams, Wm. E., New York, N. Y.

HOSE.
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Independent Pneumatic Tool Co., Chicago, Ill.

HOSE COUPLINGS.
Independent Pneumatic Tool Co., Chicago, Ill.

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International Oxygen Co., New York, N. Y.

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Clothel Co., The, New York City, N. Y.
Roelker, H. B., New York City, N. Y.

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Electro-Dynamic Co., Bayonne, N. J.

McNab Co., Bridgeport, Conn.
INDICATORS.
(Direction.)

Cummings Ship Instrument Works, Boston.
Electro-Dynamic Co., Bayonne, N. J.

McNab Co., Bridgeport, Conn.
INDICATORS.
(Recording.)

McNab Co., Bridgeport, Conn.
INDICATORS.
(Speed.)

Cummings Ship Instrument Works, Boston.
McNab Co., Bridgeport, Conn.
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Hutchinson & Co., Cleveland, O.
Richardson, W. C., & Co., Cleveland, O.

Vance & Joys, Milwaukee, Wis.
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Hanna, M. A., & Co., Cleveland, O.

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(Buoy.)

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Drein, Thomas, & Son, Wilmington, Del.

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(Inanasilk.)
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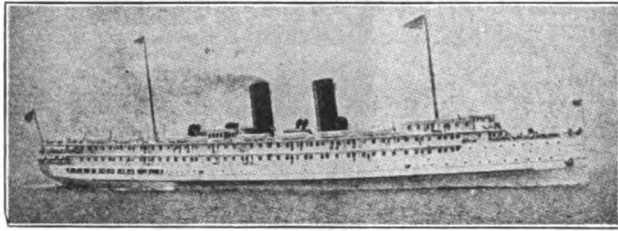
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LUBRICATING GRAPHITE.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

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Chicago Ship Building Co., South Chicago, Ill.
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Milwaukee Dry Dock Co., Milwaukee, Wis.
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Locomotive Superheater Co., New York, N. Y.

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Waterbury Co., New York, N. Y.

MARINE COVERED WIRE ROPE.
Waterbury Co., New York, N. Y.

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(Electric.)
Electro-Dynamic Co., Bayonne, N. J.
General Electric Co., Schenectady, N. Y.

MOTORS.
(Winch.)
General Electric Co., Schenectady, N. Y.

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Waterbury Co., New York, N. Y.

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International Oxygen Co., New York City.

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Home Rubber Co., Trenton, N. J.

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U. S. Metallic Packing, The, Co., Philadelphia

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Patterson-Sargent Co., Cleveland, O.

PAINT.
(Marine.)
Patterson-Sargent Co., Cleveland, O.

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Siggers & Siggers, Washington, D. C.

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Hanna, M. A., & Co., Cleveland, O.

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(Welded Steel.)
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Johnston Bros., Ferrysburg, Mich.

SHIP BUILDERS.
Manitowoc Ship Building Co., Manitowoc, Wis.

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Milwaukee Dry Dock Co., Milwaukee, Wis.

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Moore & Scott Iron Works, San Francisco.

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Seattle Const. & Dry Dock Co., Seattle, Wash.

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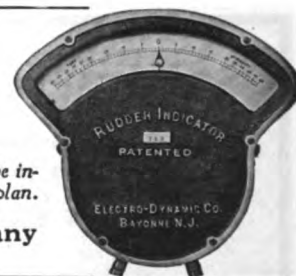
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FOR SALE

GASOLINE TUG "HAROLD A" DESCRIPTION.

50-ft. keel; 55-ft. overall; 10-ft. 6-in. beam. Equipped with 4 cylinders, 40-H. P. Fairbanks, Morse Engine. We are operating the "Harold A" at Ashland, Wis., where same can be inspected.

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FOR SALE.

TUG "SAUGATUCK" DESCRIPTION.

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Three Boilers, which have been used very little in about eight months, dimensions as follows: 66-in. diameter, by 18 ft. long, fitted with 70—¾-in. by 18 ft. charcoal tubes, thickness of shell ¼ in., thickness of head ¼ in. gages of tubes No. 10; tripple riveted butt straps on longitudinal seams; horsepower from 125 to 140 each "Normal"; allowed government pressure 150 lbs. to sq. in. (Dimensions of one Boiler same as above, except 2 ft. shorter.) For particulars write, TOWLES STEAMSHIP LINE, W. H. Towles, Owner, Fort Meyers, Fla.

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Electrically equipped. Best of service and rate guaranteed. Steel parts reinforced and shaped. Machine shop conveniences.
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2—10½-ft. diameter by 12-ft. long, two corrugated furnaces each Boiler, steam pressure 180 lbs. Complete with all fittings including sheet iron breeching and double smoke stack arranged for Boilers to set side by side. Boilers now on dock of the Thames Tow Boat Co., New London, Conn.

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Business requires only one tug, we will sell either:

Tug John Hunsader.....	Built. Tonnage.
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Leatham & Smith T. & W. Co.,
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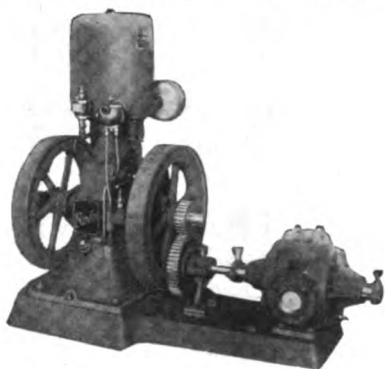
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A letter from any of our customers will prove to you they are superior.

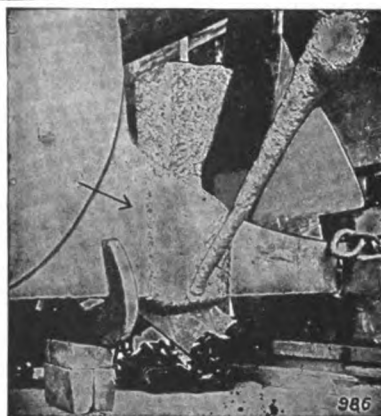
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Priming not necessary.

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Quick Marine Repairs

Thermit Welding is quick, easy and effective—and when applied to broken rudder frames, sternposts, or sternframes, will enable your vessel to return to service in two or three days, effecting a tremendous saving in dry dock charges.

There is nothing experimental about Thermit Welding. During the last few years we have executed many repairs for the principal steamship companies of the Atlantic and Pacific coasts and the Great Lakes and every repair has been uniformly successful and our best advertisement.

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M.A. HANNA & Co.

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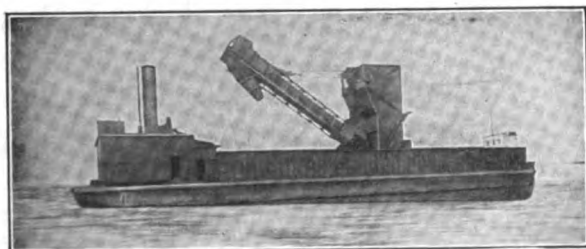
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Lighter "West Shore," Buffalo, N. Y.
Capacity 500 Tons per hour

FUEL LIGHTERS at Buffalo, Erie, Ashtabula, Cleveland. At Detour, Mich., a Fuel Dock equipped with chute capacity of 600 tons. Best quality Pittsburgh coal furnished at any time during day or night.

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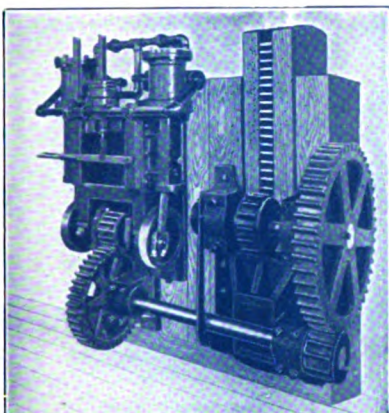
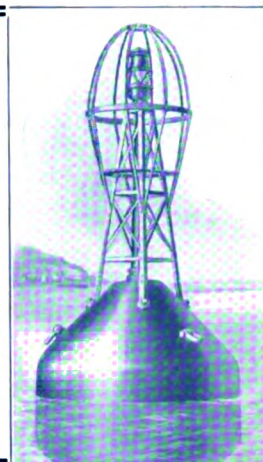
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Anchor Hoist Engines and Lock Plates for Operating Dredge and Drill Boat Anchors

Double 6" x 6", 7" x 9" and 9" x 10" Throttle Reverse Engines

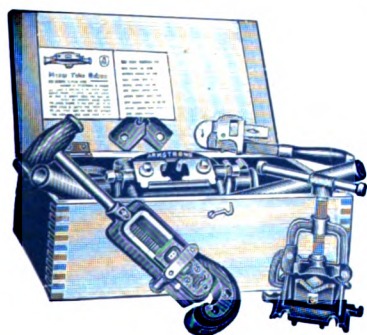
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The Hoist is compact and efficient, and occupies no deck room. Any arrangement can be made to suit local conditions.

We build the engines with either throttle or link reverse, as well as non-reversible and for a great many purposes.

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ARMSTRONG COMBINATION KITS

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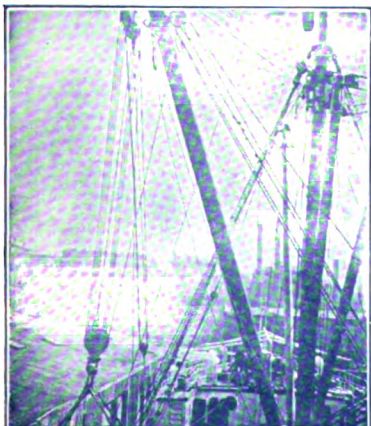
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| 1 No. 2 Genuine Armstrong Stock | $\frac{1}{4}$ in. to 1 in. R |
| 1 " 1 Model B Pipe Cutter | $\frac{1}{8}$ " $\frac{1}{4}$ |
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| 1 10 in. Stillson Wrench | $\frac{1}{8}$ " 1 |

STOCKS ARE FITTED WITH BARD ADJUSTABLE BUSHING
IN A HARD WOOD CASE
ENGINEERS AND FITTERS APPRECIATE THIS KIT.

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Durable Wire Rope Co.

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Durable Wire Rope will Not Rust or Rot and is not affected by Salt Water or Climatic Conditions

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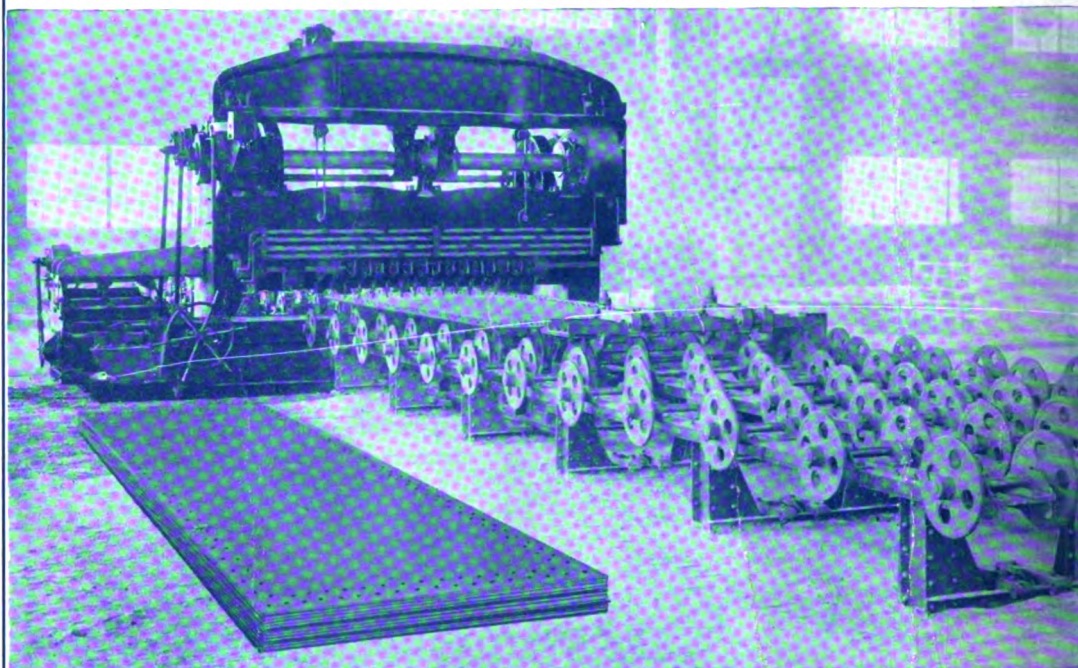
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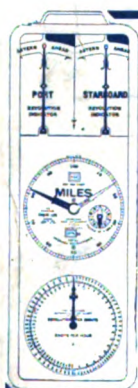
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FOR PUNCHING ALL KINDS OF PLATES
Ship—Steel Barges—Tanks—Boilers, Etc.
STANDARD BRIDGE TOOL CO., **Pittsburg, Pa.**



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R. P. M.
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SEE AT A GLANCE

just what your engines and
ship are doing, by installing

CUMMINGS ENGINE LOG SYSTEM

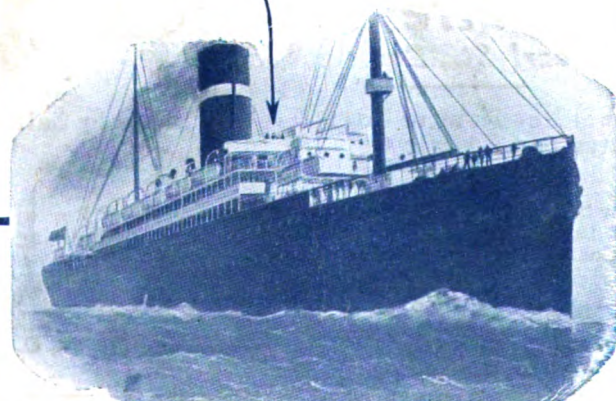
Upon the captain depends the safety
of his ship and crew.
He should use every precaution
within his means to protect his trust.

One of the greatest modern marine
safety devices is the **Cummings
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With a Cummings Engine Log in the
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through the heaviest fog without
danger. The distance and speed he is
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No other
INJECTOR
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market
so simple,
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VOL. 46

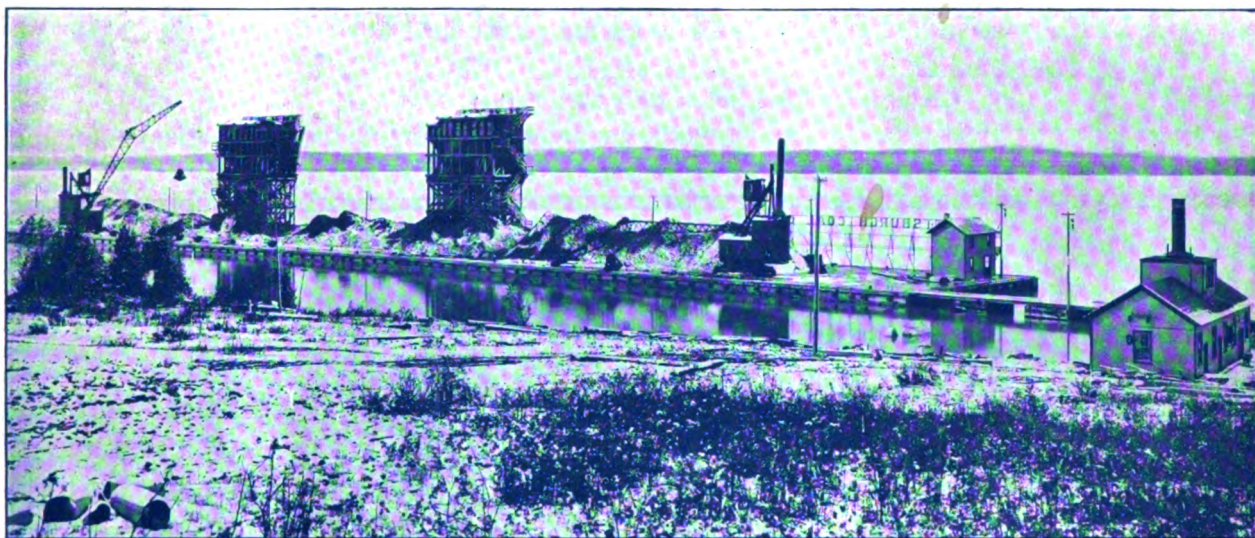
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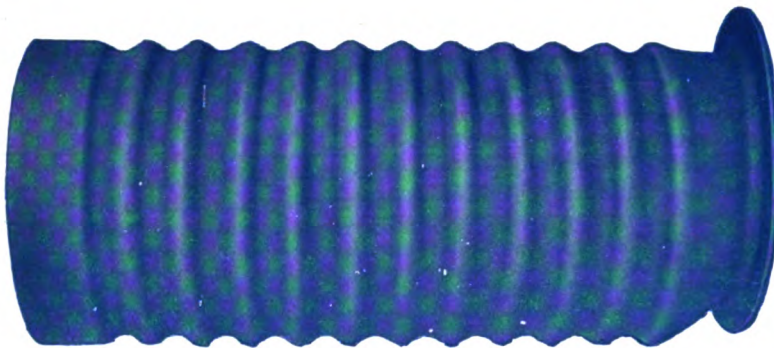
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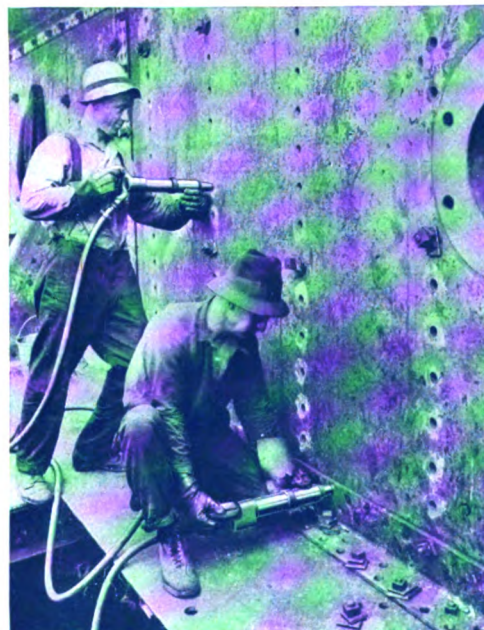
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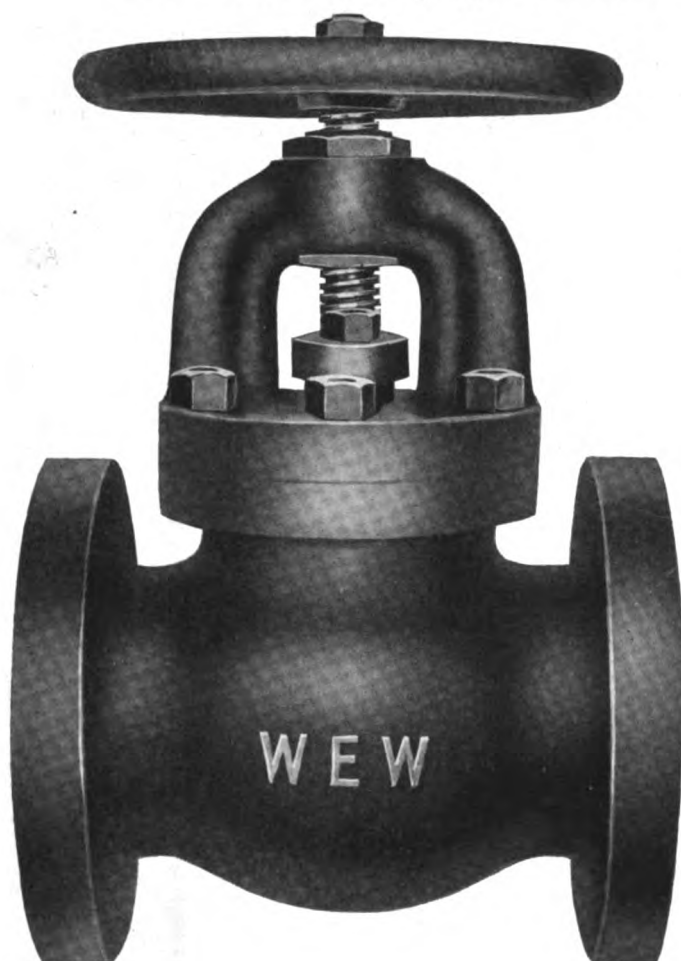
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